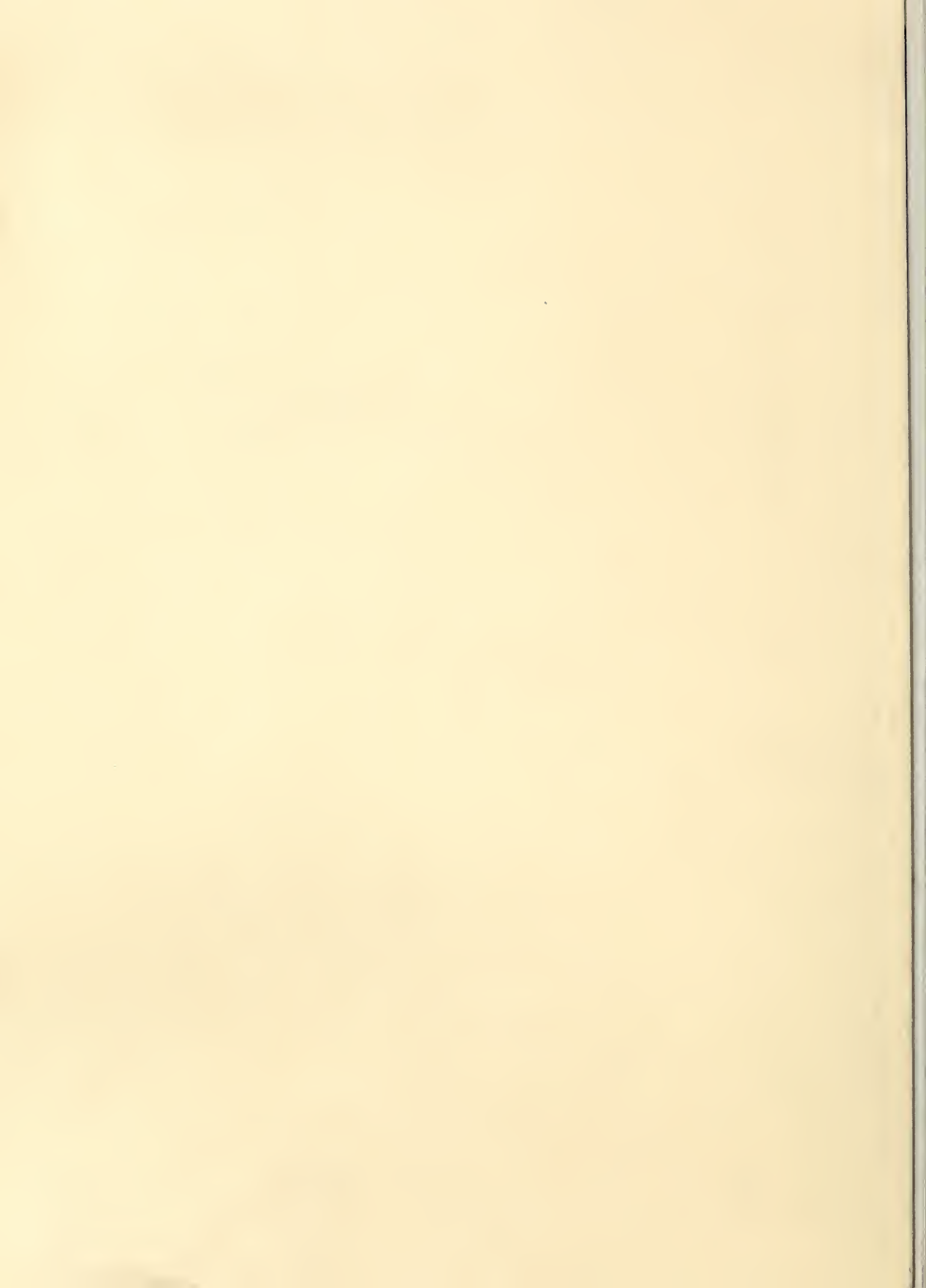


## **Historic, Archive Document**

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# BETTER FRUIT

VOLUME VI

NUMBER 10

APRIL, 1912

Single Copy 10c



FRUIT AND FOLIAGE OF  
VESUVIUS PLUM  
(One-half natural size)

*Courtesy of  
Fancher Creek  
Nurseries*

**BETTER FRUIT PUBLISHING CO.**  
HOOD RIVER, OREGON

Subscription \$1.00 per Year  
in the United States and Canada  
Foreign, including postage, \$1.50



# What Constitutes a Good Spray Pump?

- High Pressure—to throw a strong, fine spray.
- A Pump—of sufficient capacity under slow speed.
- An Agitator—to keep mixture well stirred so that it cannot clog pipes and nozzles.
- Some Method of Cleaning the strainer.

Ask any fruit farmer with experience. He will tell you that the most annoying thing is to find pump, suction or nozzles clogged when he has a tank full of spray mixture in the orchard and must clean out before his sprayer will work.

## Here We Come In

Automatic Brushes with Mechanical Agitators furnished with Empire King Barrel Pump and Watson-Ospraymo Potato Sprayer, also with Leader-Triplex Gasoline Engine Machines of 10 gallons per minute capacity, and capable of a nozzle pressure of 250 to 300 pounds.

These Triplex Pumps are run only 40 to 50 revolutions per minute. This slow speed means long life, greater efficiency, less up-keep cost, the weight is not too heavy for two horses—1550 pounds with 2 H.P. engine and 150 gallon tank, including wagon with five-inch tires; or with 3½ H.P. engine and 200 gallon tank, 1800 pounds.

The prices are not too high for efficiency, durability, capacity and satisfaction.

Are you interested? A postal will bring you into touch with our nearest agency.

FIELD FORCE PUMP CO.  
Dept. B ELMIRA, N. Y.

Insist on  
This Trade Mark



# More American Centrifugals are used for Irrigation Pumping than any other



The reason is the American Centrifugal is the highest development of the most modern type of pump and it is made by pump designers of 43 years' experience, and not merely pump builders.

American Centrifugals are made in over fifty regular styles in any size and equipped with any power.

Catalogue 117, the most complete centrifugal pump catalogue ever issued describes them.

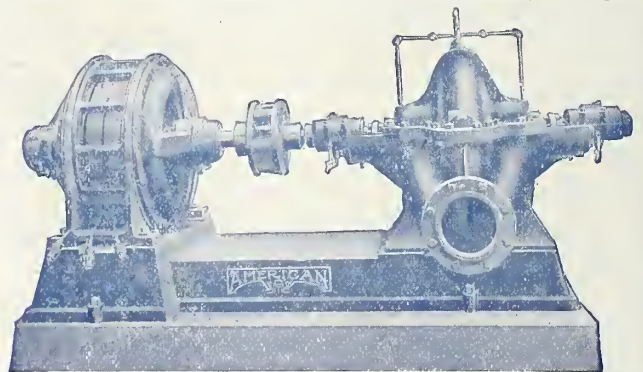
Write for it.

## THE AMERICAN WELL WORKS

General Office and Works: Aurora, Illinois, U. S. A.  
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PACIFIC COAST SALES AGENCIES:

70 Fremont Street, San Francisco. 341 S. Los Angeles Street, Los Angeles



# This Light Weight Grader Will Solve Your Irrigation Problems

It is an all-steel one-man machine. It weighs only 600 pounds. It will stir your soil, level your land, cut laterals, pick up dirt and drop it where you want it, and cut ditches 2½ to 36 inches deep at a cost of 2 cents a rod. It will do more work than big heavy graders in less time and with less effort. One man with two horses operates it. Ditches cut with the 20th Century Grader are "V" shaped, with firm, solid sides—no fear of their being washed down.

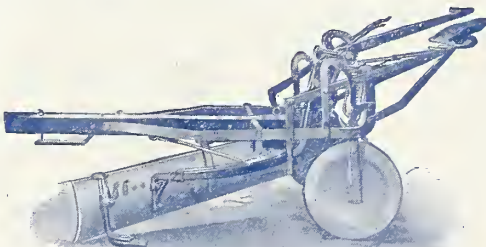
## 20th Century Grader

is a many purpose, easily operated machine that pays for itself over and over again and puts money into your pocket.

To get big results your work must be right, so you must have the right machine.

Let us tell you what others say about this wonderful machine. We want to prove to your satisfaction that it's a genuine money-maker. There are many uses to which the 20th Century Grader is specially adapted and many ways you can make big money by using it on your own land and on your neighbors'.

Write for our interesting and valuable free book giving full information about this money-making machine, what it has done for thousands and will do for you.



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542 Hunter Building  
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# THE UNPRECEDENTED DEMAND

This season has again conclusively proven



## NIAGARA LIME-SULPHUR SPRAY'S

high quality, and that our price is right. We do not have to cut prices to meet competition nor cut quality to lower the price.

As a winter spray, summer spray, fall spray it suits every condition because it is made right from pure chemicals.

We are agents for the celebrated

## Ansbacher's Triangle Arsenate of Lead

99% pure by U. S. Department of Agriculture analysis. There is NO GRIT in TRIANGLE LEAD to clog the spray machine and cut the fruit.

NIAGARA Lime-Sulphur Spray and TRIANGLE Arsenate of Lead are staple goods sold at a staple price, the same to everybody.

Our booklet, "Science of Spraying," free on request.

## Hood River Spray Manufacturing Co.

Box 54R

HOOD RIVER, OREGON



# No-Rim-Cut Tires—10% Oversize

## Touch the Million Mark

**This month we celebrate.**

**A million Goodyear Auto Tires have now gone into use.**

**Over half that number have been used within the past 12 months. Yet this is our 13th year.**

**Think what that means. More used this last year than in 12 years altogether.**

**Just because No-Rim-Cut tires—our patented type—suddenly became the sensation.**

**A few men proved them out. Then thousands proved them—then tens of thousands more.**

**Now a million tires. Now a trebled demand over last year. Now a larger sale than any other tire commands.**

### 200,000 Users—127 Makers Adopt Them

No-Rim-Cut tires have been tested, probably, on 200,000 cars. And this flood-like demand is the result of that testing.

For the year 1912, 127 leading motor car makers have contracted for Goodyear tires.

That means the reign of a new-type tire—a tire that cuts tire bills in two.

It means that men who know, want tires that can't rim-cut. They want oversize tires, to save the blow-outs due to overloading.

They want hookless tires. And they want tires which embody the final results of 13 years spent in perfecting them.

They get all these features in No-Rim-Cut tires. Yet they cost no more than other standard tires.

So these 200,000 demand these tires, as you will when you know.

#### **Old-Type Tires**

The old-type tires which No-Rim-Cuts are displacing are known as clincher tires.

They have hooks on the base, which hook into the rim flange.

When the tire is not kept fully inflated, or run flat, the rim flanges cut it. Such tires are often ruined in a single block.

No-Rim-Cut tires have no hooks on the base. Yet they fit any standard rim. These

tires make rim-cutting forever impossible, as a glance at the tires will show you.

And they are twice as easy to detach as old-type clincher tires.

#### **Average Saving 48 Per Cent**

Statistics show that 23 per cent of all ruined clincher tires are rim-cut.

No-Rim-Cut tires forever end that worry and expense.

Then No-Rim-Cut tires are 10 per cent over the rated size. That means 10 per cent more air—10 per cent greater carrying capacity. And that, with the average car, adds 25 per cent to the tire mileage.

Thus we figure 48 per cent. It varies, of course, with proper use or abuse. Your cost for tire upkeep depends somewhat on you.

But this saving of rim cutting, plus the added size, will cut the average tire upkeep in two. And tens of thousands have proved it.

#### **No Extra Price**

No-Rim-Cut tires now cost no more than other standard tires. They used to cost one-fifth extra.

Think what that means.

Tires which can't rim-cut cost the same as tires that do. Oversize tires cost the same as skimpy tires.

You are offered your choice at an equal price. Which tire will you take?

#### **We Control Them**

We control by patents the only way to make a practical tire of this new type.

Six flat bands of 126 braided wires are vulcanized into the tire base.

Other devices are employed to make a hookless tire, but in use they have proved very unsatisfactory.

That is why the demand for this new-type tire has centered on Goodyear No-Rim-Cut tires.

When you change from the old type—as you will—do not adopt an experiment. Get the tire of which one million have been tested out.

No-Rim-Cut tires, in these days of tire wisdom, far outsell all others. Get these tires.

Our 1912 Tire Book—based on 13 years spent in tire making—is filled with facts you should know. Ask us to mail it to you.

**GOOD YEAR**  
  
**No-Rim-Cut Tires**  
**With or Without Non-Skid Treads**

### **THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO**

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We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits

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WE HAVE MODERN COLD STORAGE FACILITIES  
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Pears and Cantaloupes

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Oregon

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in Fancy Apples, Pears and  
Strawberries

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Strictly commission house. Specialists in  
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tatives in England.

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QUALITY  
QUALITY**



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Our Engineering Department is at your service without cost to you.

We can give you expert advice regarding cost of operation and the best methods of installation to insure the highest efficiency.

We will help you select the proper equipment.

In fact, our Engineering advice covers every phase of irrigation by means of power pumping.

Our line of pumping machinery is the old established GOULDS LINE of centrifugal and power pumps for gasoline and electric drive, both belted and direct connected.

The power equipment comprises the FAMOUS NEW-WAY AIR COOLED and R. & V. water cooled gasoline engines and the standard lines of electric motors.

The stocks we carry are complete and our service combined with the quality assures you of the very best satisfaction.

**The John Deere Plow Company**  
OF PORTLAND, OREGON

Spokane

Boise

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## Butte Potato & Produce Co.

BUTTE, MONTANA

Jobbers of all Farm and Orchard Products

We have a large outlet for fruits and vegetables. We want to hear from shippers.

A. J. KNIEVEL  
President and Manager

Sixteen years' experience on the Butte market.

## LINDSAY & CO. Ltd.

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*Established in Helena a Quarter Century*

Branch houses: Great Falls, Missoula and Billings, Montana

## Hemingway's Lead Arsenate

The brand which is used in all of the great apple growing districts of the country—Western New York, Michigan, the Blue Ridge Slopes, the Ozarks and the famous valleys of the great Northwest

### Hemingway's Lead Arsenate

is of the highest standard of manufacture. We claim the following points of superiority:

### Perfect Physical Condition

i.e., fineness of grain and ease in thinning down in water

### Correct Analysis

i.e., full percentage of Arsenic Oxide (not less than 15%) and no more than a trace of Soluble Arsenic

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*Blast etched cuts have a printing quality which has never before been obtainable with process engraved plates . . . . .*  
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That's the only kind to buy. Good trees bring success and poor trees failure. Fruit growers know this. They do not experiment. They buy non-irrigated, whole root, budded trees, and we number scores of them on our list of well pleased customers. We have prepared this season for an immense business. That means trees, trees, trees without limit as to variety and quantity. We also have an immense stock of small fruits and ornamentals. We solicit your confidence, and will take care of the rest. Catalogue on application.

**Salem Nursery Company, Salem, Oregon**  
Reliable and live salesmen wanted

**SOIL** Rich black gravelly loam with clay subsoil, very productive with irrigation.

**WATER** Abundance of fine water over which there never can be litigation.

**MARKET** Three miles from Spokane's 125,000 hungry people. Easy access to mining, timber, wheat belts of Inland Empire, as well as Eastern markets.

**TRANSPORTATION** Spokane the largest railroad center west of Mississippi River. Three steam roads, two electric lines through our property.

**CLIMATE** Fine

**CONVENIENCES** Electric light, domestic water, mail delivery, street cars, etc.

Write for particulars to

**OPPORTUNITY-VERA LAND CO.**  
403 Sprague Avenue Spokane, Washington



# Fall 1912—Spring 1913

We wish to announce that we are now contracting for future delivery during the above seasons. We are prepared with a full line of Fruit Trees, Nut Trees, Ornamental Trees, and Shrubbery, both Fruit and Ornamental.

**Our Leader—a fruit tree with a one-year-old top and a three-year-old root**

An opportunity for a salesman to avail himself of a good income and a course in the Pacific Horticultural Correspondence School.

## Capital City Nursery Company

413-416 U. S. National Bank Building

SALEM, OREGON

# Hood River Apple Trees For Sale

Hood River by its scientific apple growing has produced apples of such quality that they command the highest prices and are known in every market in the world.

It has specialized on a few varieties and developed them to perfection. From this stock, the most highly developed in the world, we have selected our scions, and now offer for sale—

VIGOROUS TREES, WELL ROOTED, TRUE TO NAME, AS FOLLOWS:

**Spitzenberg, Newtown, Ortley,  
Arkansas Black, Gravenstein**

We also have a good selection of the other good standard varieties grown in the Northwest.

Our stock is the best. Please write us for quotations. You will find OUR PRICES ARE RIGHT.

**Hood River Standard Nursery, Hood River, Oregon**

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IS YOUR MAGAZINE—IT IS THE RECOGNIZED AUTHORITY ON ALL THINGS PERTAINING TO THE PACIFIC COAST COUNTRY—YOUR COUNTRY.

# Sunset, The Pacific Monthly

WILL KEEP YOU IN TOUCH WITH THE PROGRESS AND DEVELOPMENT OF THE PACIFIC COAST COUNTRY, AND IT GIVES YOU AN OPPORTUNITY TO KEEP SOME FRIEND IN THE EAST IN TOUCH WITH THIS "WONDERLAND BEYOND THE ROCKIES."

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	<i>Regular Price</i>	<i>Special Price</i>
Two one-year "Sunset, The Pacific Monthly" subscriptions	\$3.00	<b>\$2.00</b>
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# Protect Your Orchard Against Tree Poisoning

The object of spraying with Arsenate of Lead is to protect the fruit from the attacks of insects. If the trees are poisoned, retarding their development and ultimately killing them, it is obvious that the good results obtained from spraying are offset. Therefore it is essential that you select a material that will be effective yet harmless to use.

Of the two forms of Arsenate of Lead on the market, it has been conclusively proven that the Acid-material is more liable to poison the soil and thus injure the tree. This is due to its containing a large amount of arsenic oxide which is loosely combined with the lead. When brought in contact with the alkaline water in the soil, free arsenic is liberated and is taken up by the tree, thus causing the poisoning.

The Neutral or Sherwin-Williams New Process Arsenate of Lead is a form of Arsen-



Fruit from a healthy tree



Fruit from a poisoned tree

ate of Lead, containing the maximum amount of arsenic oxide possible to have in thorough combination with lead. All the arsenic is combined at the proper strength to be effective against the cod-

ling moth and other leaf-eating insects without having any tendency to disintegrate and poison the tree when absorbed by the soil. S-W Neutral New Process Arsenate of Lead stays in suspension better than the Acid-material and covers the foliage evenly, giving it superior adhesive qualities.

S-W New Process Arsenate of Lead should be used by every fruit-grower, particularly where there is alkali in the soil.

*Write for our Agent's name in your locality*



**THE SHERWIN-WILLIAMS CO.**

INSECTICIDE AND FUNGICIDE MAKERS

707 CANAL ROAD

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Has no peer in the Northwest

And so we have established

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along similar lines in behalf of the great irrigated fruit districts of the Rocky Mountain region, a companion paper to this, your favorite fruit magazine.

We have made it up-to-date, clean, high class editorially, mechanically and pictorially.

The subscription rate is \$1.00 per year. It is worth it.

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## 5,000 Acres All in Apples

Over 3,000 acres of it has gone, mostly to Eastern people. The remainder will be gone by spring.

We plant and develop for five years, guaranteeing to turn over to you a full set, perfectly conditioned commercial orchard. After the expiration of the five years we will continue the care of your orchard for you, if desired, for actual cost, plus 10 per cent.

Planting and care is under supervision of the

### Churchill-Matthews Company

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The largest and most experienced planters in the Pacific Northwest

We will be glad to meet personally, or to hear by mail, from anyone considering the purchase of an apple orchard or apple land. On account of the bigness of the project, everything is done on a wholesale basis and prices for our tracts are proportionately lower. Reasonable terms. All our purchasers are high class people. No others wanted.

Write for booklet, or call on

### DUFUR ORCHARD COMPANY

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# IDEAL NURSERY STOCK

We have all of the Standard Varieties for the Northwest and invite inspection of what we have to offer

Our scions are selected with care from Hood River Orchards. Our stock is grown in Hood River

**Reasonable Prices and Special Inducements to Large Planters**

We also have a very fine block of Clark Seedling Strawberry Plants to offer  
Also small fruits for the home garden

IF INTERESTED, WRITE FOR PRICES AND CATALOGUE TO  
IDEAL FRUIT AND NURSERY CO., Hood River Oregon

## Arcadia Irrigated Orchards

**The Largest Irrigated Orchard Project in the Northwest**

Arcadia is located twenty-two miles from Spokane. Our soil is rich and deep, entirely free from gravel, rock and alkali. Gravity irrigation, excellent transportation, ideal climate, no dust or sand storms.

**OUR PLAN:** We plant, cultivate, irrigate, spray, prune and care for the orchard for four years. Water free. Real estate taxes paid for five years. Over 4,000 acres is now planted to winter apples. You may remain at your present occupation while your orchard is brought to bearing, or, if desired, move onto the land at once.

**TERMS:** \$125.00 first payment secures five acres; \$250.00 first payment secures ten acres; balance monthly. Eight years in which to pay for your orchard. Write for literature.

ARCADIA ORCHARDS COMPANY, SPOKANE, WASHINGTON

## If You Want the Best Orchard Land in Oregon

I have what you want, whether it is five to forty acres for a HOME ORCHARD, or 400 acres for subdivision.

I have land in the Hood River Valley or in the Mount Hood Valley adjoining Dufur.

If you do not want to take possession at once, your land will be planted and cared for, in the best manner, for you for from three to five years, when it will come into bearing.

For further particulars address, P. O. BOX 86, HOOD RIVER, OREGON

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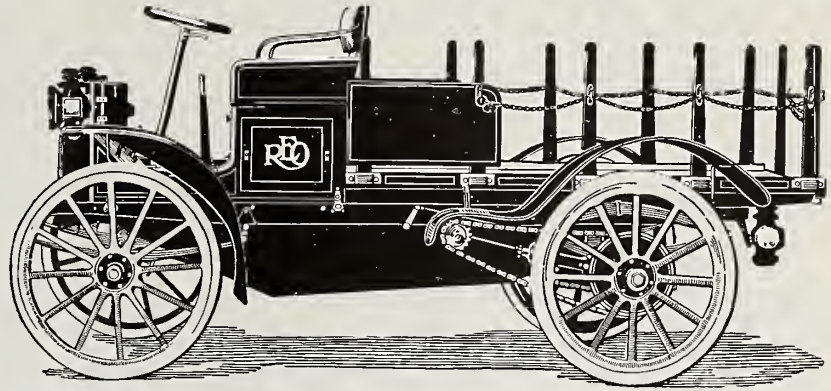
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OUR SPECIALTIES ARE APPLES AND PEARS



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Wheel base, 90 inches—Horsepower, 10 to 12—Length behind seat, 6 feet—  
Capacity, 1,500 pounds. Front seat top, \$25 extra

## Only \$750

### Operation—50 Cents a Day

The Reo Truck, designed by R. E. Olds—a truck of 1,500 pounds capacity—is sold for \$750.

Compel those who ask \$1,200 and up to prove their extra value.

We have a mammoth plant built for trucks alone.

We are building trucks there at a minimum cost, and adding a minimum profit.

We are selling these trucks through Reo dealers, already established in a thousand towns.

The result of this policy is a price you can't match on a truck of like capacity.

### Two Years of Tests

Mr. R. E. Olds, this truck's designer, is a very careful man.

He has built automobiles for 25 years—tens of thousands of them.

When he offers a truck you may be sure that truck is right.

To test this truck, under every condition, he put hundreds of them into service.

He tested them out in forty sections, in thirty lines of business. And these tests have now covered two years.

One loaded truck was run from New York to Oregon. Two carried the baggage in the Glidden Tour, from New York to Jacksonville.

Whatever requirement a truck must meet, these trucks have been made to meet.

Wherever you are—whatever your service—the Reo truck will do what you expect.

### Simple—Strong—Efficient

A boy in ten minutes can learn to operate this truck. He can care for it, too. No expert is needed.

There is nothing to get out of order. Simply supply it with gasoline and oil.

The cost of gasoline, oil and repairs, as per many tests, has averaged under 50 cents per day.

One truck can do five times the work of a one-horse dray. It can do it three times as quickly. It can do it at 60 per cent of the cost of horse delivery.

It can do it in any weather, on any road, in rain or snow or mud. It is always ready, and it costs you nothing when it isn't busy.

You will cease your horse delivery when you prove this truck.

Our local dealer will demonstrate the truck. He will teach your man to run it. He will render Reo service.

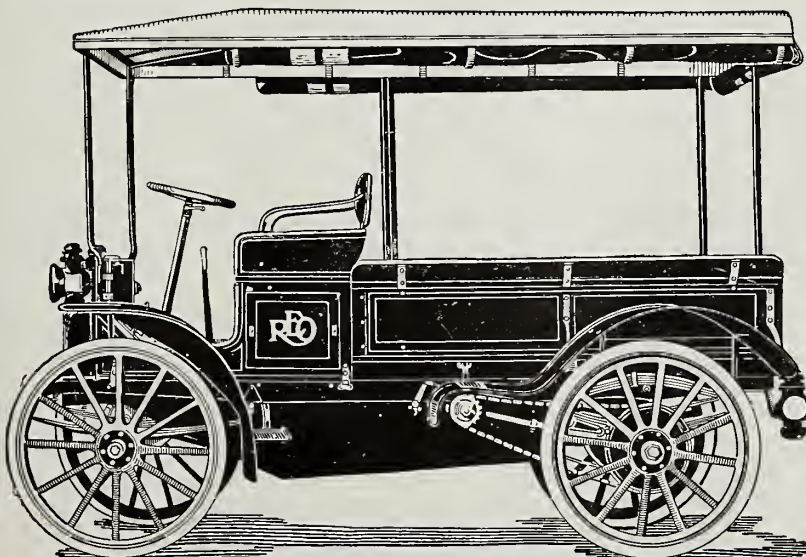
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Price \$750 f.o.b. Factory. Top over all, as shown in cut, \$50 extra



# Farm ALL Your Land — Pull the Stumps With the Hercules All-Steel Triple Power Stump Puller

—30 Days' Free Trial—and  
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From Michigan

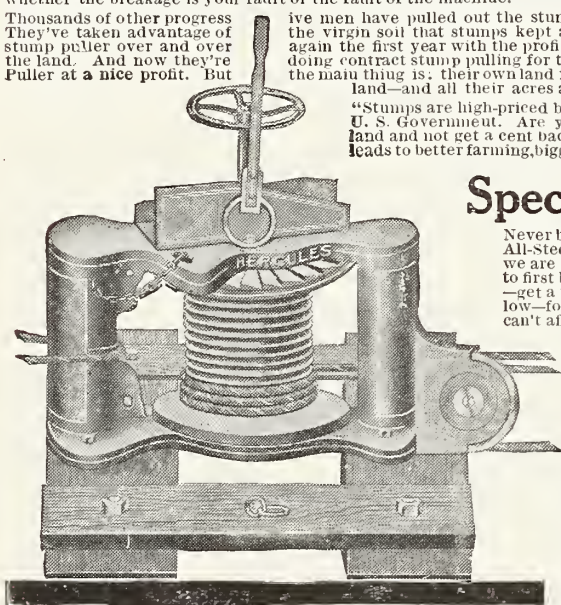
Pull out every stump—roots and all—with the famous Hercules All-Steel, Triple Power Stump Puller, at the rate of an acre a day—so you can farm more acres and double the value of land now full of stumps.

The Hercules is the only puller that's **all steel**. It's 60 per cent lighter and 400 per cent stronger than any iron puller ever made. So strong and powerful, it pulls any size stump, green tree or hedge in 5 minutes, or less. And every part of the Hercules is guaranteed against breakage for three full years—all broken castings replaced free of charge whether the breakage is your fault or the fault of the machine.

Thousands of other progress  
They've taken advantage of  
stump puller over and over  
the land. And now they're  
Puller at a nice profit. But

ive men have pulled out the stumps on their land instead of buying new lands. The virgin soil that stumps kept away from cultivation. They've paid for their again the first year with the profits from the extra crops and increased value of doing contract stump pulling for their neighbors or renting their Hercules Stump the main thing is: their own land is free from costly stumps—they farm all their land—and all their acres are at top-notch realty value.

"Stumps are high-priced boarders who never pay their board"—says the U. S. Government. Are you going to keep on paying taxes for stumpy land and not get a cent back? Or are you going to take the step **now** that leads to better farming, bigger profits and greater realty value of your farm?



## Special Offer NOW

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thousands of extra dollars by owning a Hercules. All-Steel, Triple Power, Self-Anchored or Stump-Anchored, Double Safety Ratchets, Perfect Turning and Machining of all parts, 3-year guarantee against breakage and our 30 days' free trial offer ought—at least—to induce you to

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I think the Hercules All-Steel, Triple Power Stump Puller is the greatest machine that ever was put on the market. It is so easy to handle that my little boy twelve years old is handling it fine. The little boy and myself are clearing an acre a day of some of the thickest field pines and the land is being plowed. It certainly is a great machine.

*D. S. Cade of Veedsburg, Ind., writes:*  
"We pulled about 400 stumps that had been cut about 7 or 8 years. We have raised almost enough corn on the field over other years to pay for it, as we could check the corn and plow with cultivator before we had to plow with double shovel."

*W. O. Bodie of Batesburg, S. C., writes:*

"I have pulled over 1,800 stumps in my spare time during the last month. It's a Hercules, Triple Power for me every time."

*W. J. Hatch of Grandy, Fla., writes:*

"Many friends come from far and near to see my Hercules work. All are wonderfully pleased. Two men who came several miles to see it work went right back home and ordered one just like it for themselves. I pulled all the stumps in about 15 days. Some measured three feet in diameter. That was our first work and we were green hands' with it. There were over 2,000 stumps, some tap roots measuring 15 and 16 feet."

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# BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

## The Care and Management of Orchards

By Professor C. I. Lewis, Horticulturist, Oregon Agricultural College

**O**REGON is a very large state, containing many varied conditions. The elevation extends from sea level to the limit of plant growth, and the rainfall ranges from 130 down to two inches. One can find in this state climatic conditions that will suit every taste. There are regions where frosts are hardy ever known; others are subject to fairly cold winters. There are great ranges in summer temperature. Some of the valleys are able to produce almost tropical growth. The Cascade range of mountains divides the state into two great sections, each of which has many special divisions. As one enters the state from the east he finds on the eastern boundary that some development has taken place at Ontario and vicinity. This region, while but slightly developed, has conditions somewhat similar to those of the Payette Valley of Idaho, which is quite highly developed. At Baker quite a large acreage has been devoted to orchards, but only a very small percentage is in bearing. The Grande Ronde Valley is one of the largest fertile valleys of Eastern Oregon situated along the railroad. The rainfall here is about seventeen inches. The soils for the greater part are rich alluvial bottoms; the hill lands generally are worthless for fruit growing. At La Grande there is an extensive area given over to apples. Imbler, the famous sandy ridge formerly thought worthless, has developed into a fine fruit district, while at Cove apples and cherries are extensively grown. Irrigation, as applied to fruit growing, is practiced only to a limited extent in this region, but in the future will become much more extensive. At Freewater-Milton, in the Walla Walla Valley, we find quite an extensive fruit industry; prunes, apples, pears, peaches and small fruits all receive considerable attention. The rainfall in this district is about twenty inches. Considerable irrigation is practiced, especially in the early summer. It is a rich, fertile valley and is especially adapted for early fruits. The so-called stony soils of that district are very early. Proceeding westward we reach the Umatilla irrigation project. This is a government project recently placed under irrigation and is being sold in forty-acre units. A mere start has been made at the present time. The soil, sandy in character, has indications that it will be splendid for truck crops and early fruits. The Umatilla experiment farm, a branch of the Oregon experiment station, is situated at Hermiston, and

is devoted largely to fruit growing. As far as fruit growing is concerned, Central Oregon at the present time is very slightly developed. There are a number of locations that are producing first class fruit and give great promise of becoming commercial centers of fruit growing. Many regions, however, are too frosty, have insufficient drainage and in places the soils are too thin to ever allow successful commercial orcharding. In the Eagle and Pine Valleys, in the vicinity of Baker, considerable area is being devoted to fruit growing and the outlook is promising. In the famous John Day Valley extensive orchards have been planted and

growing is to be found, and at the cove near Madras, in the vicinity of the mouth of the Metolus River, a considerable area is to be found which is promising as a fruit district. In the Fremont and Fort Rock districts, up to the present time, but little or nothing has been attempted along the line of fruit growing. In all probability some of hardiest varieties of fruit will succeed, but probably for home orchard planting only. Orchardring should not be undertaken commercially in this district from present indications. In the Silver and Christmas Lake districts the soils for the greater part are unadapted for most fruits and vegetables. In general the soil is very shallow. Hardy vegetables are doing fairly well, but only where the soil is fertilized or irrigated. In some of the more sheltered districts and foothills good fruit can probably be grown in limited quantities, but probably never on an extensive commercial scale.

At Summer Lake we find one of the most inviting fruit districts to be found in all Central Oregon, on the western shore of the lake. This region seems admirably adapted to the growing of fruits of every description. Even such tender fruits as apricots succeed, while such vegetables as tomatoes grow to a high degree of perfection. The soil is very good, ranging from a sand through the loams to muck as one nears the lake. Undoubtedly the lake has an influence in that region. Fruits of all kinds seem to yield excellent crops and the product is of splendid quality. Such apples as Spitzenberg and Winter Banana have taken a very high color, and the entire region seems to be admirably adapted to the growing of fruits and vegetables on a commercial scale. There is considerable activity in this region, a considerable area being planted to young orchards. Chewauchen Valley is now largely given up to stock raising, but there are a few home orchards that seem to be producing fair crops, but not what would be called commercial yields. It is possible that fruit may succeed on the foothills, but the valley proper is too flat and frosty for commercial fruit production. At Goose Lake there are few home orchards to be found on the north and west shores, but these are hardly worthy of mention, as the trees are rather spindly and at times the yield is even insufficient for home use. In all probability fruit growing on this side of the lake will never be a paying proposition commercially. On the east side of the lake, however, one finds

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SUBSTITUTION OF LIME-SULPHUR PREPARATIONS FOR BORDEAUX MIXTURE

METHODS OF CULTURE FOR OUR BRAMBLE FRUITS

APPLES RECOMMENDED FOR COMMERCIAL PLANTING IN UNITED STATES AND CANADA

BACK TO THE FARM—A REMEDY FOR MANY ILLS

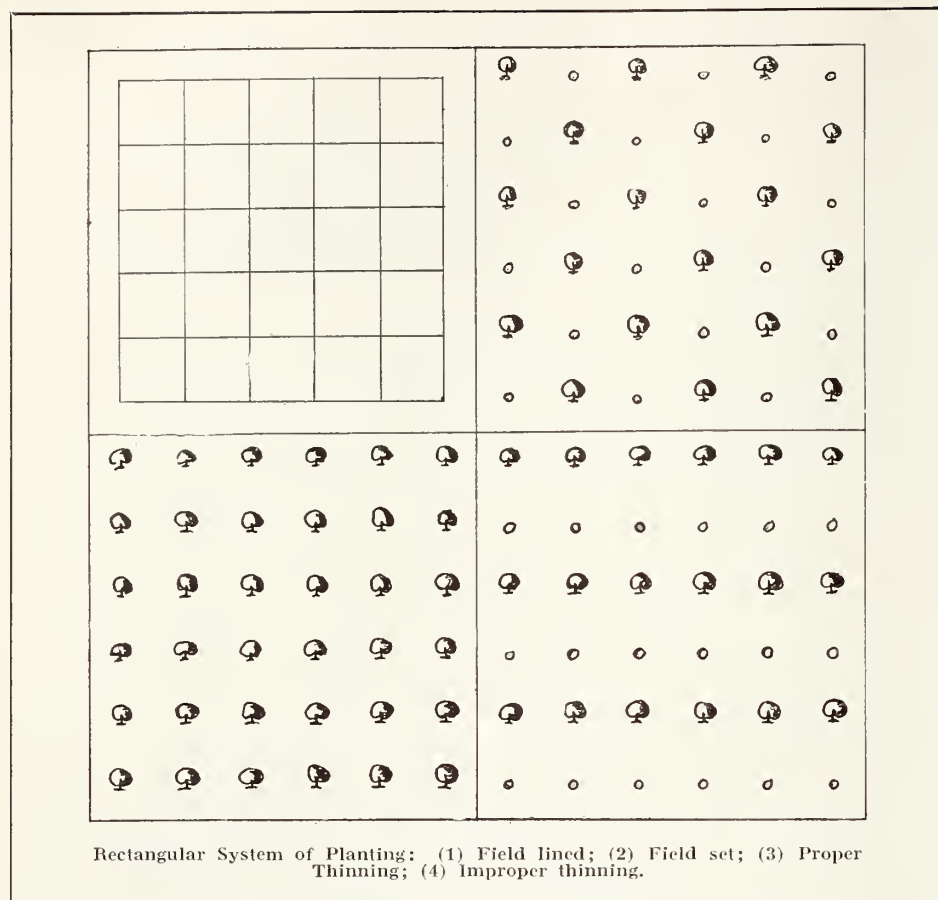
CITRUS PROTECTIVE LEAGUE OF CALIFORNIA

SOME HAWAIIAN FRUITS

THE RED SPIDER

are in heavy bearing. Indications are that considerable area of that valley will be devoted to fruit growing. At times frosts will do some injury and one should select locations with that end in view. In such sections as Harney County fruit growing is developed to a rather limited extent. The valley lands, in many cases, are too poorly drained for fruit growing, and many of the hill lands are too bleak and exposed for this industry. However, one finds on some of the foothills and in regions subject to canyon and valley breezes, orchard areas that are producing unusually good crops. In Rosland, La Pine and Odell districts very little attempt has been made along the lines of fruit growing, and only a few vegetables, such as cabbages and beets, are grown. In all probability most of that area will be too frosty for the growing of tender fruits and vegetables. In the vicinity of Powell Buttes, near Prineville, a considerable area adapted to fruit





splendid home orchards. Some irrigation is being practiced, but orchards are being grown both with and without irrigation; in all probability the unirrigated orchards are to a large extent sub-irrigated. The fruit possibilities of this side of the lake seem to be much the same as those found at Summer Lake. Apples take on splendid color, the trees produce heavily and make splendid, vigorous growth. Small fruits do especially well and the climatic conditions are such as to allow the growing of the tender fruits, and even such vegetables as tomatoes, cucumbers, etc. Much of this side of the lake could be developed into a splendid fruit growing district, and should be given more attention. Most of the activity is confined to Pine Creek and New Pine Creek. It is to be feared that the vicinity of Hampton Butte will be too frosty for successful fruit production on a commercial scale, and one should plant in that region only the hardiest fruits. At Warner Lake little should be done with fruit, although at Odell there are regions supposed to be adapted to fruit growing and limited areas are being devoted to this industry. In the vicinity of The Dalles, on the Columbia, extensive fruit areas are found. Peaches, prunes, cherries and grapes are all being grown for shipment. To the south, on some of the table lands and in some of the valleys, especially in the vicinity of Dufur, considerable areas are being planted to apples.

Twenty-two miles west of The Dalles we find the famous Hood River Valley.

This district has earned world-wide reputation for its apples. Yellow Newtown and Spitzenberg are the principal varieties. It has about 10,000 acres in orchards, has seven or eight different types of soil, all of which grow fruit successfully when supplied with humus and when deep and drained thoroughly both as to air and soil. The region which is directly above the town of Hood River is known as the lower valley, while in the vicinity of Mount Hood is the upper valley. In the upper valley we find rich, fertile soil, but as yet few bearing orchards in that district. With the proper handling the prospects are very encouraging for orcharding. The elevation of Hood River Valley ranges from 600 to 2,500 feet. The rainfall is about thirty-five inches. The main apples are Yellow Newtown, Spitzenberg, Ortley and Jonathan. Between Hood River and The Dalles is a small valley known as the Mosier district. This district has much the same conditions as are found in the Hood River Valley. Formerly a great many prunes were grown in this district, but it is becoming chiefly an apple district, producing such varieties as Newtown, Spitzenberg, Ortley, etc.

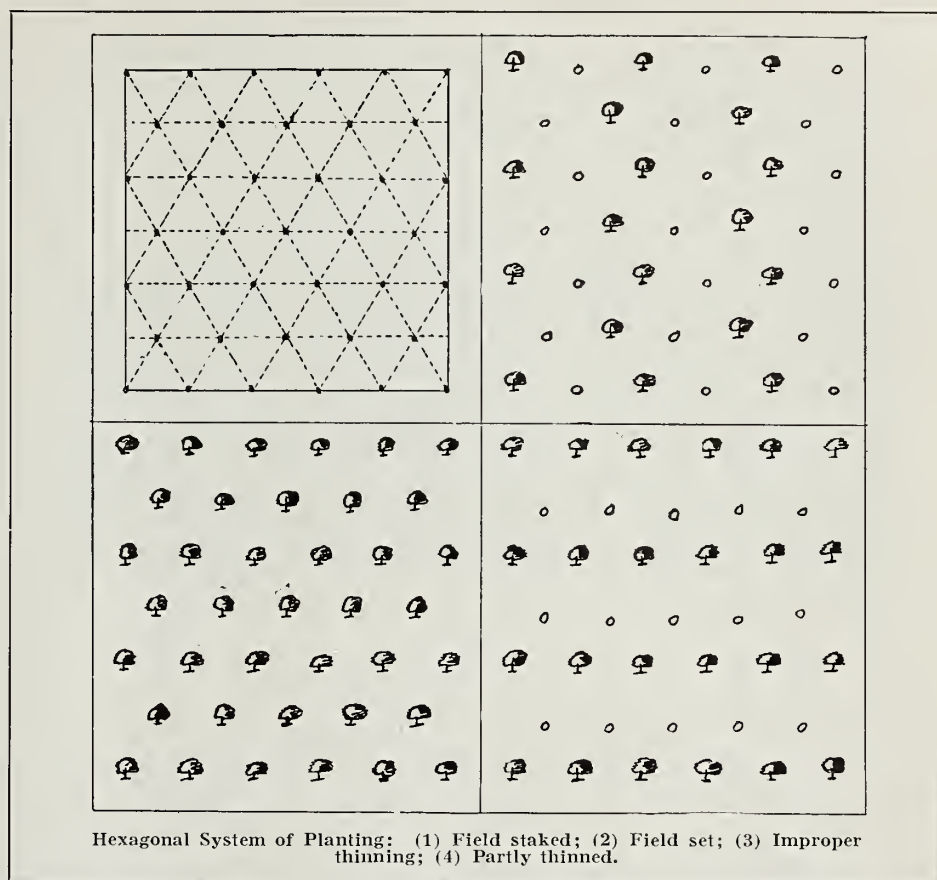
The next district of interest is the Willamette Valley, which extends from Portland on the north to Cottage Grove on the south, one hundred and fifty miles long and sixty miles in width. The rainfall varies from thirty to sixty inches. It is a valley of great variations and wide adaptability. The river bottom lands are splendidly adapted for peaches and truck crops. Cherries have also done well on these bottom

lands, and orchards of apples and pears, in a number of cases, are making successful growths. Young walnut trees planted on many of these lands have made splendid development. Whether they will prove to be apple and pear lands on an extensive scale will need further demonstration, the one point being that excessive frosts might damage such crops where the orchard locations were at the base of benches quite a distance from the river. Directly above the river soils which are generally sandy and silt soils we find, especially in the upper part of the valley, quite extensive areas of so-called white land. Fruit has never been grown on these lands to any great extent, and probably never will be grown until drainage has been undertaken, although with drainage the pear can, in all probability, be successfully grown in preference to other fruits. Apples, likewise, would be very promising. Small fruits do especially well on such lands. Between these white lands and the foothill lands will be found the gently rolling clay loams, splendidly adapted for apples and pears. In the lower part of the valley, in such counties as Washington, Yamhill, etc., are found such areas as we might term table lands, tending from an elevation of 500 to 1,500 feet, or in some cases to the very base of snow-capped peaks. Where these are deep and contain strong clay loams they are splendidly adapted for the growing of apples and pears. Some of the lighter loams seem adapted for the growing of cherries and prunes. Wherever of great depth walnuts should also thrive. The foothill lands, which one finds extending from the table lands south to the white lands of the valley, are as a whole more adapted for prunes and cherries than for any other crops. They are apt to be thin and poor to the west and south exposure, but deep and of greater value to the north and east; it is true not only in this valley but also in the valleys found to the south. There seems to be a general tendency for these hill lands to become poorer as they extend southward. The Willamette Valley is the center of the famous Italian prune industry and the cherry industry of the state. The principal walnut interests of the state are also found in this valley, while the apple and pear industries are also increasing rapidly. The Umpqua Valley, found immediately south of the Willamette Valley, has twenty-five inches rainfall, and its rich, gentle, rolling bottom lands are splendidly adapted for apple and pear culture. It is the earliest valley we have in the state, producing the first cherries and strawberries for our markets. More attention should be paid to the production of our early fruits. Many of the hill lands, which are light in character, grow small fruits to splendid advantage. Some irrigation is practiced in the Umpqua, although the greater part of the valley is not irrigated. Prunes receive some attention, although apples



lead. One can find deep soils adapted to all classes of fruits.

Continuing southward we come to the vast Rogue River Valley, extending from the vicinity of Merlin to Ashland, containing many thousands of acres planted to fruit, the present acreage being estimated all the way from 40,000 to 60,000 acres. Rainfall is all the way from nineteen to twenty-five inches. This region has a world-wide reputation for its pears. Apples are also being grown very extensively. There is a tremendous range of soils and elevations. The hill lands are more adapted for peaches and cherries than for the other crops. Some of the rich red hill lands, with sunny exposures and elevated beyond fogs or frosts, are well adapted to the growing of such European varieties of grapes as Muscat, Tokay and Malaga, which are produced in unsurpassed quality. There is an opportunity for a large development of the grape industry. With the extension of irrigation many of the uplands along the hillsides will become famous for apple and pear growing. The bottom lands show a wonderful range of soils, from the heaviest adobe to good free soils, sand, silt loams, etc. Fruit is being grown on each. The bottom lands, at times, are subject to frosts. It will take some years yet to determine just what conditions are best adapted to the best varieties of fruits. It is thought by many that such pears as Bartlett, Bosc and Comice grow better on some of the lighter loams, while the Winter Nelis thrives best on the strong, rich loams. The Yellow Newtowns are found growing on the heaviest adobe as well as on the lighter soils on the hillsides,

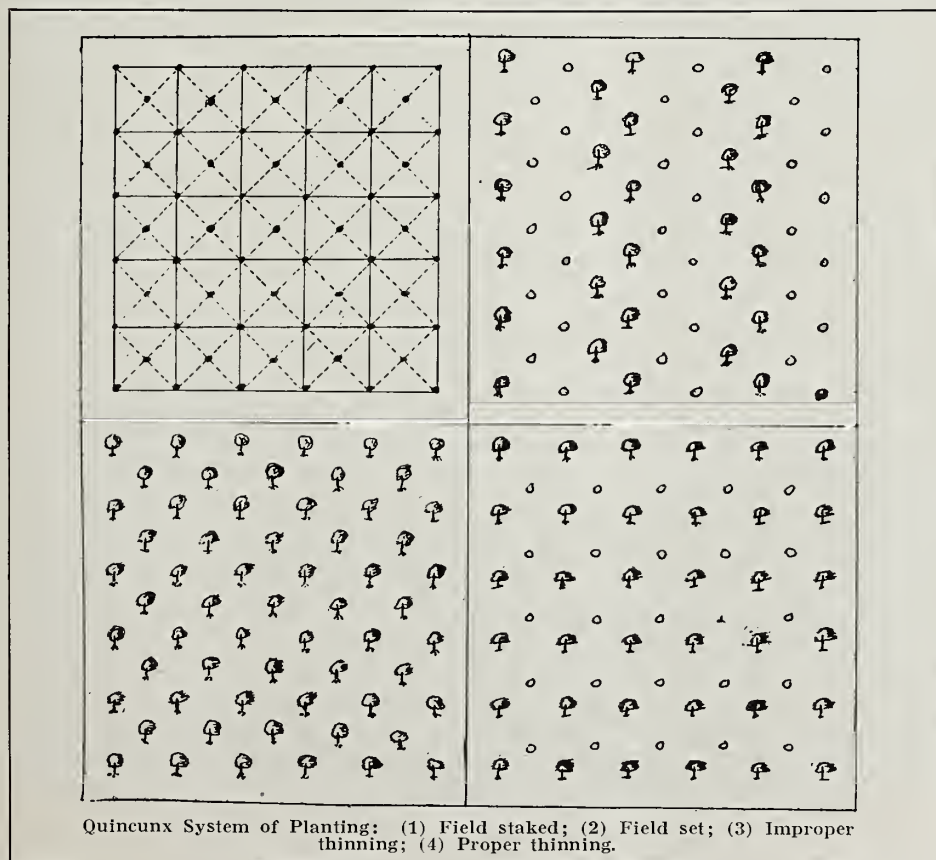


there being very often one month's difference in the maturity of the fruit under such conditions.

Overproduction of fruit is a dread which seems to hang over the heads of many people interested in fruit growing. Overproduction has very rarely occurred in American fruit growing;

at times we have had poor distribution, and in 1896, owing to a heavy crop and poor distribution, one might say an overproduction was realized, but we have had nothing of the kind since then, and both apple and pear production has been downward, the shrinkage being from seventy-six million barrels in 1896 to twenty-five million barrels in 1910. With the proper organization, with good distribution, with fruit growers controlling their fruit and handling it when placed on the market for consumption, with storage in transit rates, there is a field for fruit production for all classes. One must also remember that the average yield is low and that there are thousands of trees that will never become profitable owing to being planted in improper locations as regards soils, frosts, etc., to poor management, to unwise choice of varieties; and one must remember that there is a large acreage each year that is practically going out of bearing.

The average man, in choosing an orchard, is apt to think that soil analysis is the panacea for all troubles, and that analysis will show what can be grown to advantage on his soil. In choosing an orchard there are many points to be considered, which will vary more or less in degree of importance according to locality. These points are air and soil drainage, exposure, elevation, depth of soil, general character of the soil. In the various Northwest fruit growing sections one must have the natural conditions which are conducive for fruit growing before one is concerned about the soil. Foolish comparisons are often made between irrigated and non-irrigated







Windbreak greatly needed. Only by the most judicious pruning can these trees be balanced, and then only with difficulty. Staking would have helped many of these trees

districts. Each district probably has its advantages as well as its disadvantages. East of the Cascades, in regions where it is impossible to irrigate, the soil must be of good depth if one is to grow fruit successfully. The silt loams and volcanic ash soils are much more retentive of the moisture than the sandy types. In such cases one needs to pay close attention to immunity from frosts. In the irrigated districts of Eastern Oregon extreme depth of soil may not be as necessary, although it is very desirable. Good drainage, on the other hand, becomes very essential; we must try to avoid seepage water and the accumulation of alkali; the orchards along the high line ditches are apt to suffer less from such dangers. In some of these districts one finds all types of fruits being grown in the same orchard. With abundance of water one can at times overcome the drawbacks, such as the lack of the desired kind of soil. Often the sandy soils, with plenty of moisture, will produce many types of fruit, such as apples, pears, peaches, prunes, cherries, grapes and small fruits, all in the same orchard, under similar conditions. I have never yet seen, however, an orchard under irrigated conditions, planted to many types of fruit, producing them all to a high degree of perfection. Peaches and apples, for example, need entirely different treatment, different amounts of water and different times of application. What might be ideal for peaches may be poor for apples, and vice versa. One of the special points to observe in irrigated districts is good drainage, seepage water often becoming a menace. Many of the valleys are also subject to frosts, and one should study such conditions carefully.

In Western and Southern Oregon, where irrigation is not practiced, one should strive for good depth of soil. A good way to determine this is to get a carpenter's auger of half-inch diameter and screw into this a section of small gas pipe. With this instrument

borings four or five feet, or much deeper, may be made. While I have seen such fruit as apples grown on shallow soil underlaid by disintegrated rock, nevertheless I should avoid soils that are underlaid with hardpan, soapstone, loose gravel or cement gravel at a depth of four or five feet from the surface. Be sure of good soil and splendid air drainage. Exposure becomes important with some classes of fruit; the Spitzenberg, for example, does better on the warm, rich, but not too heavy soil, and in a sunny exposure. On some of the rolling lands and bottom lands one needs to be careful about seepage waters, which retard the trees growth unless proper drainage is given. In the irrigated sections of Southern and Western Oregon good depth is desirable and splendid drainage becomes very essential. One should choose locations that are provided with good air circulation. Where such fruits as grapes are to be grown they should be placed on a sunny exposure, where they can get the maximum amount of sunshine and warmth in the fall of the year, and where they are not subjected

to fogs and frosts when the fruit is ripening. Exposure, elevation, good air drainage all play an important part in a successful orchard.

At times the profits in orcharding throughout the Northwest are somewhat hard to believe. There are many authentic records of profits exceeding \$1,000 per acre. The average profits, however, are not nearly as great, and many people will be disappointed in their orchard investment because they are expecting unusual and unreasonable returns. In establishing profits one should compile figures extending over a series of years; they should be based on average good orchard conditions, and we should take for granted that the person interested has average ability. Under average conditions one can at present expect an income of about \$200 net per acre. The income will depend, of course, upon the personal element and the acreage, methods of management, etc. Many people are choosing too small an acreage. While the ten-acre tract is an inviting investment to the man who cannot live on his land for a number of years, nevertheless the income from such tracts will, in the majority of cases, be disappointing. Under average conditions the ten-acre tract is not large enough to insure the desired income and support the family in many cases, at least not to the degree that many of the investors would desire. The ten-acre tract as a rule should be purchased with the aim in view of producing an income rather than absolute support, as is often expected. Some tracts, especially those of wide adaptability, of splendid soils, and with irrigation waters, may be able to come up to expectations. However, these are not average conditions. Unfortunately many tracts are not in proper and good locations, and there is a tendency at times not to give them the best commercial care. Prospective buyers are often quoted bonanza figures which are based on some unusual yields and not average conditions. There are many companies that are doing all in their power to grow first class



Permissible in a young orchard, but the crop is somewhat too heavy. Never grow grains, but garden truck may be grown if necessary.



orchards. The best advice to give a purchaser is to come and see the lands before buying. Often very fair returns are realized where one diversifies on ten-acre tracts. In such cases a few hogs can be kept, a few chickens, two or three acres in fruit and some acreage in strawberries. The average ten-acre tract, however, is too expensive to manage, and it is not a sufficient acreage to insure a good income for a family during the series of years. The cheapest unit to establish an orchard is about forty acres, as one man and a pair of horses can do the work on an acreage of this size up to the time the trees come into bearing. Forty acres can also be managed by planting ten to twenty or thirty acres at the start, and have enough land for chickens, hogs and other side lines to be handled to give the family a living until the orchard comes into bearing. After the orchard comes into bearing it is doubtful if one can undertake any specialties other than the orchard. Taken on the supposition of forty-acre units, one can probably care for an orchard for the first four or five years for about \$100 to \$150 per acre. This includes the price of the planting and setting of the trees, cultivation, pruning, etc.; the total cost would depend on the initial price of the land, whether or not clearing will be necessary or the acreage to be developed. Exclusive of price of land and including interest on investment and all running expenses, it will cost from \$150 to \$350 an acre to bring an orchard up to four years of age.

Clearing of timber lands and stump lands is at the best quite expensive. The cost will vary all the way from \$25 to \$150 per acre, according to the density of the growth and the size of the stumps and the opportunity to dispose of lumber or wood. Many methods are used in clearing land, such as blasting, burning, the use of char pit and the air pressure methods, and piling with donkey engines and after-



Corrugated roller. One of the best tools to use on clay loams

ward burning. These all have their special advantages, and the chances are that in clearing a large area one would use all these systems to a more or less extent. Special information concerning the char pit method of burning stumps can be had by addressing the Portland Commercial Club, Portland, Oregon. The Puyallup Station, at Puyallup, Washington, issued an interesting bulletin on burning stumps by using an engine to give forced draught. In a general way fir stump land, where the growth has been heavy, is apt to be good fruit land if it has proper air drainage. Oak stumpage or timber may be on good land, although in many cases oak trees will thrive on land that would not be considered first class fruit land. It is not safe to choose land for fruit simply because it grows large oak trees. It has been customary to advise one not to plant young trees on oak stump land until several crops have been grown owing to the presence of mushroom fungus, but this has not been as thoroughly worked out as might be desired, and many men are planting orchards even before all the stumps are removed, as the small oak stumps will

decay so that they can be plowed out in a few years. Some men prefer never to plant on newly cleared land, claiming trees make a poor growth and that it is a better practice to plant crops for a few years before setting trees. This undoubtedly depends on the amount of plant food available and the thorough preparation before planting. On fir land the organic matter may not decay so as to be available for trees for some time. However, it has been my observation that where the ground has been thoroughly worked down before planting and the setting of trees is not delayed until too late in the spring, the young trees planted grow very nicely. On some of the silt loams peaches are being successfully grown before the land is thoroughly cleared. With sagebrush lands it is often better not to clear the land entirely until one has supplied it with enough humus to prevent blowing. The best method to prescribe is to clear a strip and pile the brush along in rows in right angles to the prevailing winds. The brush should not be removed until the soil is well filled with humus and the ground has become settled and established so there

is no danger from shifting soils during the windy periods. It is a fatal mistake to clear large areas of light soils covered with sagebrush where there are strong prevailing winds, as under such circumstances the soil will blow badly.

In most cases it will pay to give thorough preparation to the land before planting. In the heavy clay soils this may also mean subsoiling. Where land has been devoted to grain growing for a number of years it is often desirable to subsoil in strips where trees are planted. In newly cleared lands the soil is well supplied with humus, although perhaps not well decayed, and good preparation in this case, while often seeming not as essential as in old wheat lands, is in most cases necessary, as



Arrangement of walnuts and prunes. Every other row is set to walnuts. Every third or fourth row would be better, thus allowing fifty feet between trees.



these lands are often very uneven and loose. It is believed that in newly irrigated sections, on soils devoid of humus, it is better to grow crops a few years before attempting to grow fruit trees. We are now conducting experiments along this line.

The matter of buying trees needs very careful attention. Orders should be placed early for nursery stock, owing to the fact that for the last few years the supply has not been equal to the demand. One should in all cases insist on procuring what are known as one-year-old trees. It is true that in various irrigated sections they are able to grow a large tree from a piece root in one year, but there is a tendency to force the tree unwisely. It will probably make little difference whether the tree is grown with or without irrigation, provided the trees have not suffered from lack of proper handling and from excessive irrigation. We have been encouraging nurserymen to grow extra tall trees, we should encourage them to grow trees of larger caliber and good, heavy base; the medium tree of large caliber is better than the high spindling tree. It is extremely desirable to have trees well supplied



An orchard correctly planted and in a good state of cultivation. These trees show beautiful symmetry and good care.

with buds, scattered over the entire length; this assists materially in forming a good head with branches well spaced. As soon as trees are received from the nurseries remove them from boxes and, the ground having been previously plowed out, heel them in as soon as possible. Delay may be disastrous to the tree. It is desirable with such trees as peaches, prunes

and cherries to have them heeled in with tops facing the south, as the buds will remain dormant for a longer time than if pointed toward the north. Cover roots firmly and well. If the roots are allowed to freeze in any way they will probably die. Never handle young trees when they are frozen. Never heel them in bundles and let them remain for an extended period, as they will often die from scald, drying out, or even freezing if the earth is too loose around the roots. The bundles should be cut and the trees heeled in singly. Occasionally when trees arrive in a shriveled or dried condition they can be revived by burying the trees entirely in damp sod for a few days; this will often cause the bark to become plump again.

In all the regions of the state subject to extreme low temperature in winter,

such as zero or lower, and more especially where the ground is exposed to such extremes and dry freezing is experienced, spring planting is preferable, but in all other sections of the state fall planting is much to be preferred. In Western and Southern Oregon it is desirable to plant trees by the first or middle of March. Trees planted in late fall or early winter become established and make a quicker and better growth than those planted in the spring. I have noticed a smaller percentage of the trees die, and in many sections even less winter killing, with the fall planting of trees. In the latter case it may have been due to improper care of trees before planting.

There are a number of systems that may be used in planting an orchard; each has its defects and its strong points. The most common system is the rectangular. According to this system the trees are planted in rectangles or squares. The main advantage of this system is that it allows one to cultivate both ways to the best advantage, especially when the trees become large. It does not, however, give equal distribution of the trees over the ground. In planting orchards by this system, with the intention of thinning out later on, one can easily make mistakes. The common mistake is to plant trees twenty feet apart each way, and then to think that by taking out every other tree the distance will be increased to forty feet. On the contrary, they will be left in squares, running diagonally across the field, twenty-eight feet apart. It would be necessary to take out three-fourths of the trees to throw them forty feet apart. The second system is the quincunx. This is not used to any great extent at the present time, but has many advantages and is desirable where fillers are to be used. It means planting in fives. One can make permanent plantings in the rectangle or square and then place another tree in the center of each rectangle or square. When the trees crowd the center one can easily be removed. In this way



Photo by Gagnon

Showing a cluster of Wenatchee "Moorpark" Apriots, grown on the C. A. Brown orchard in the Ohio Colony, six miles east of Wenatchee, in the lower end of the valley.



you can plant seventy-five per cent more trees to the acre than you can by the rectangle. The hexagonal system is based on the circle, but can be planted with an equilateral triangle. The trees are really planted in groups of seven, six trees in a circle with one in the center. It has the advantage that all trees are equally distant and each receives an equal distribution of air and light. However, by this system cultivation is rendered more difficult than by the rectangular system, especially when the trees begin to crowd a little. While fillers can be used, the system does not work as nicely from a horticulturist's point of view as does the quincunx, which, horticulturally, is the most ideal to me where close planting or fillers are desired. The hexagonal gives fifteen per cent more trees to the acre than does the rectangular.

#### NUMBER OF TREES PER ACRE

Distance Apart	Rectan- gular	Quin- cunx	Hexag- onal
16 x 16.....	170	303	196
18 x 18.....	134	239	154
20 x 20.....	108	192	124
22 x 22.....	90	148	104
24 x 24.....	76	132	87
25 x 25.....	70	125	80
26 x 26.....	64	114	74
28 x 28.....	56	100	64
30 x 30.....	48	85	55
32 x 32.....	43	76	49
33 x 33.....	40	71	46
36 x 36.....	34	60	39
40 x 40.....	27	48	32
45 x 45.....	22	39	25

The distance to plant trees varies according to the type of fruit, variety, soil, elevation, etc. On strong soils of low elevation greater distances are needed than on the higher elevations and the lighter soils. In some of the uplands of Eastern Oregon and on some of the hill lands of Western Oregon 25 to 28 feet will be sufficient for apples, while on the stronger soils 30 to 35 feet is more desirable; pears, 20 to 25 feet; peaches, 12 to 20. Many growers are giving more room. Trees grow larger as a rule in Western and Southern Oregon than they do in Eastern Oregon. Prunes formerly had sixteen feet, but the older orchards need twenty-five feet to do best. Mature sweet cherries should have thirty-five to forty feet, while the young orchards of sour cherries need about twenty feet. Walnuts require all the way from forty to sixty feet. One often finds that certain varieties of fruits do not need the maximum distances. Among our apples some of the less sturdy growers are the Yellow Newtown, Ortley, Rome Beauty, Ben Davis, Duchess, Yellow Bellflower and Wagener.

The size of the hole dug for planting trees will depend on the conditions. In the volcanic soils large holes are not as necessary as with heavy soils. On clay loams and all heavy soils more attention must be given to this subject. It is better not to dig holes as wide as is practiced by some people, nor should they be dug a long time before you plant the trees. Often the question is asked, "Does it pay to blast holes for planting?" Generally I would say no, as such soils are apt to be poor for fruit. There might be exceptions to this, however, where it is desirable to loosen up clay, and more especially

where one wishes to break up a shallow hardpan. Generally cut off one-half to one-third of the root system, and on planting remove all broken and injured roots. Avoid letting the roots become too dry and never expose them to freezing. The Stringfellow system of pruning and planting is on the whole not very satisfactory with us. Many growers do not set trees firm enough and thousands die because of this loose setting; they must be set firmly in all cases, and should be planted from two to three inches deeper than they were in the nursery row. In planting young trees a planting board can be used to advantage. It is a common board with a notch cut at the center and holes bored at the ends. After the orchard is staked and before the holes are dug, the board is placed so that the notch comes next to the stake and short stakes are driven through the holes in the end of the board. The board is then lifted, and when the trees are planted the board is replaced and the tree set so that it comes in the notch in the board. If this is practiced the trees will keep the exact alignment of the stakes. When there are strong prevailing winds lean the trees at the time of planting slightly to the windward. Especially should this be observed in Eastern Oregon. Where the wind is so strong as to make proper training of the trees difficult it will be found advisable to stake them. The trunk and main branches should be tied to the stake in such a way as to avoid cutting or other injury to the trees. Use broad bands for tying material and protect the branches where tied with such material as leather or heavy canvas. Windbreaks may be grown to good advantage.

Intercropping and Fillers.—These are two questions in which every orchardist is interested. It is, of course, desirable to obtain as much profit from the land as possible, and to have it

produce an income as soon as practical. In fact many orchardists must have some income while the orchard is coming into bearing. There are several ways in which this may be accomplished. One way is to plant crops between the trees. When this is done one should avoid grains, as they take a large amount of plant food that the trees need later. Potatoes are used, but these are hard on the potash of the soil. Most other truck crops are good, such as melons, squash, beans, beets, peas, etc. Undoubtedly many of the virgin soils in the Northwest would not be injured by intercropping, for chances are that clean tillage causes oxidation of much of the plant food, which is later leached out by winter rains and irrigation. There is a possibility in such cases where crops are grown between the trees that much of this plant food would be retained or utilized by the crop. On the other hand, a number of our soils should not be intercropped unless one is willing later to add plant food in some form. When intercropping is practicable, leave ample distance between the crop and the young trees, so that the latter do not suffer for want of plant food and moisture. The average man should practice intercropping carefully, as he is apt to overdo it and grow the crop at the sacrifice of proper tree development. Small fruits like strawberries are often grown. If they are planted close to the trees, and especially in those cases where irrigation is practical, the moisture and shallow cultivation encourage the young trees to become shallow rather than deep rooted. Such crops as clover and vetch are often grown, and while preferable to many other crops, if they are always harvested and never plowed under they exhaust rather than build up the soil, especially in potash. By filler system we mean planting of some trees that will be removed when the main orchard comes into heavy bearing. We try to get off a number of crops in order to bring in a large income during the first few years of bearing, and then later we plan to cut out from one-half to two-thirds when they begin to crowd. Personally I believe the best way to handle fillers is to plant the same type of fruit, as peaches with peaches, apples with apples. Dwarf pears are becoming popular as fillers and can often be used in apple and walnut orchards. The trouble is the average man is not provided with sufficient nerve to cut out trees when they begin to crowd, and as a result he allows the crowding of trees to continue until the orchard is often ruined.

Throughout the Pacific Northwest a common practice for orchardists has been what is known as the clean culture system. By this practice we mean, generally, a thorough preparation of the ground in spring, followed by frequent cultivations during the summer time. Orchardists in general feel that experience has taught them that there is no way superior to thorough tillage



Never start main limbs in this manner. They should issue in a whorl, from eight to fourteen inches apart, to prevent a bad crotch.



of the ground to maintain trees in good thrift and heavy bearing. Some of the reasons for tillage in an orchard are: To maintain a sufficient supply of moisture and to make available the plant food there is in the soil, so that trees can obtain this food; by pulverizing the soil a much greater feeding area is presented for the rootlets of the trees; by pulverizing this soil deeply in the spring of the year we also get additional root holding area for the plants. Tillage also has considerable to do with the moisture content of the orchard soils. By the spring plowing and harrowing of the ground we are apt to have less extremes of temperature, the ground is apt to become warmer and is placed in such condition that the roots can begin their activity and top growth begin early. For this reason at times one should not practice too early tillage with fruits that are apt to be caught by frosts. The stone fruits especially should not be given too early tillage. Tillage in the spring of the year increases the water holding capacity of the soil. It places the soil in such condition that it can catch the spring rains and hold them for tree growth. Later on in the summer the frequent shallow cultivations will check the rapid evaporation of moisture from the soil. Tillage promotes nitrification; it places that available element in such condition that the trees can use it: It aids in hastening decomposition of all humus and organic matter there is in the soil and tends to set plant foods of all kinds free, so that it will dissolve, and in that form or solution can enter the roots of the trees.

We must study this important subject from the point of view of soil, season, age of tree, general climatic conditions, etc. The tools that are used also differ according to conditions. Plow, corrugated roller, float, disc harrow, Kimball weeder and many other tools all have their places. Our particular object in the spring preparation is to form a reservoir for moisture and make plant food available, so as to maintain a large root feeding area in order that we may develop strong trees, with vigorous wood and abundance of good sized fruit. With most of our clay soils annual spring plowing will be necessary; with the heavier soils harrowing should follow close on the plowing, as the heavy soils tend to become packed and cloddy. They will need discing and pulverizing, and should be put into as good condition as possible. The sticky soils upon which many of the orchards are planted are exceptionally hard to handle. If they are plowed in the fall the soil runs together during the winter, and they need replowing in the spring. These soils will have to be watched closely to catch them at just the right time. If an attempt is made to plow while they are too wet they are so sticky as to be almost impossible to handle; if you attempt to plow them when they are a little dry they plow up in large lumps and it is almost impossible to do anything with them.

Occasionally these soils have been simply disced and thoroughly harrowed in place of plowing. The free soils and the sandy and silt loams work up very nicely. On the lighter of these soils, and especially with light rainfall, the problem is not so much in the spring to loosen these soils as it is to compact them. They are often rolled and floated, a drag is used, and when this is done light, shallow harrowing should always follow. Our main object in the spring is to get the ground into as good condition for growth as possible. After the rains have ceased great care must be taken to maintain as much of the moisture as possible under the soil conditions. This will mean frequent cultivations during the growing season. One of the best tools to use in such cases is the Kimball weeder; this stirs the soil freely, will pulverize the top soil and prevents drying or packing. It forms a dust mulch, which aids in retaining the moisture in the soil.

The number of times one will cultivate during the summer will vary with the soil, type of fruit, season, and the age of the trees. With young trees it is well to practice deep, thorough preparation in the spring, so as to encourage the roots to strike deeply. It is not only a problem of holding the moisture, but one of forming deep-rooted trees. As soon as sufficient growth has been obtained the summer cultivation should cease; this, in some regions, may be as early as July, while in other locations it will be about the first of August, but rarely later than the middle of August. The aim should be to throw the young trees into dormancy so that they will not be injured by premature fall frosts or suffer needlessly from cold winter weather. Bearing apple trees, on the other hand, will need cultivation in most cases up to the time the fruit is picked, since the trees draw very heav-

ily upon the soil as the fruit is maturing. The time for ceasing cultivation with bearing trees will be determined by the general condition of the tree and fruit. Cultivation influences the color and size and often the form of the fruit, the amount of juice, and has a marked influence on the percentage of drop of the fruit. As a general rule pears do not need as late cultivation as apples, with the exception of the winter varieties. The general belief is that cherries should not be cultivated, but this belief is unjustified; while cultivation of cherries should not be undertaken so early as to cause the sap to rise prematurely, nevertheless they should be given good intensive cultivation at least up to mid-summer. Thousands of cherry trees are dying from neglect. The aim should be to place the trees in good condition for the winter. There is never the danger of winter killing from over-cultivation in the case of heavily bearing trees as there is with young trees. The summer cultivation of fruit trees need not be deep. There is nothing to gain by cultivating over three inches in depth, but this cultivation should be very thorough in order to prevent baking, cracking or drying, and should be intensive enough to keep down the weeds at the time the trees need moisture. In the fall of the year the growth of weeds in young orchards would probably be an aid rather than an injury to the trees.

Now while cultivation sets plant food free and retains the moisture and gives good results as far as tree growth and production are concerned, nevertheless it may be and is being overdone in most of our fruit districts. Excessive cultivation may ruin an orchard, and has proved the Waterloo of many of those of the Pacific Northwest. It may ruin the physical character of the soil, making it too compact or lumpy on the one hand, or too loose and subject to blowing on the other hand. It destroys the fiber in the soils, burning out the organic matter, and through its oxidizing effect gradually reduces the available plant food. Instead of being an aid to many of our mature orchards, we find that in spite of all we are doing the trees are ceasing to make satisfactory growth, and in many cases the fruit is too small. The ground becomes harder and harder every year to manage. The remedy will be to add fiber to the soil and supply it with additional food in one way or another. Various remedies have been recommended to overcome these conditions, such as cover crops, shade crops, mulching, diversified farming, that is, combining the raising of hogs, poultry, etc., with fruit growing, and the purchasing of manures and commercial fertilizers. The consideration of this subject leads us into the great field of orchard fertility. The amount of plant food removed from the soil by fruits is much greater than the average man conceives. One reason that orchards do not run down as speedily as some farm lands is due to the fact that trees are deeper rooted and work over a larger area.

To be continued in May edition



Fifteen-year-old Comice pear well pruned. A convenient ladder for this work is shown at the right.



# The Substitution of Lime-Sulphur for Bordeaux Mixture

By W. M. Scott, Pathologist United States Department of Agriculture

**B**ORDEAUX MIXTURE has come into ill favor among the apple growers in recent years on account of its injurious effect upon the fruit and foliage of certain varieties, and there is a growing demand for a reliable fungicide which can be used for the control of apple diseases without producing such injury. Bordeaux mixture is undoubtedly the best all-around fungicide known, and it is unfortunate that the apple growers have to consider the possibility of giving it up, but the russeting of the fruit and the burning of the foliage caused by it are so objectionable that it seems highly desirable, if not necessary, to adopt a less injurious fungicide even at the risk of a partial sacrifice of efficiency in the control of diseases. The subject of bordeaux injury has recently been admirably discussed by Professor U. P. Hedrick of New York and by Professor C. S. Crandall of Illinois, and will be considered only incidentally in this article. During the past three years the writer has been working on the problem of securing a satisfactory substitute for bordeaux mixture, and not without some success. The self-boiled lime-sulphur wash, which was developed primarily for spraying peach trees, has been found to be an excellent spray for the control of mild cases of apple diseases and to be entirely harmless to fruit and foliage. The concentrated lime-sulphur solutions, both commercial and home prepared, when diluted to contain about four pounds of sulphur to fifty gallons of water, have proved to be about as effective in the control of apple scab and leaf-spot as bordeaux mixture, and to be much less injurious.

Professor A. B. Cordley, in 1908, seems to have been the first to point out the possibility of dilute lime-sulphur solutions as a substitute for bordeaux mixture in the treatment of apple diseases, especially scab. In an address before the 1907 meeting of the American Pomological Society the writer gave results of experiments which he conducted in Arkansas, showing that a self-boiled lime-sulphur mixture might be expected at least partially to control bitter rot and scab. Again in the *Western Fruit Grower* of January, 1909, the writer showed that the commercial lime-sulphur solution registering 32 degrees on the Baume scale, when used at a strength of one gallon to twenty-five gallons of water, would control apple scab on the Wincsap about as well as bordeaux mixture without materially injuring the fruit or foliage. In the same issue of the paper just mentioned Professor R. Kent Beattie reported the satisfactory control of apple scab by very much stronger solutions of the commercial lime-sulphur—1 to 11, 1 to 14 and 1 to 17—and he reported no injury whatever to foliage or fruit. In 1908 the writer controlled the cherry leaf-spot in Illi-

nois with the commercial lime-sulphur solution, one gallon to forty gallons of water, and with the self-boiled lime-sulphur, as well as with bordeaux mixture. During the same year experiments with the lime-sulphur solution for apple scab, conducted by the writer in Nebraska and Arkansas, gave good results, and similar experiments conducted in New Hampshire during the same year by Dr. Charles Brooks in co-operation with the writer showed the commercial solution to be almost as effective against apple scab as bordeaux mixture. Mr. Errett Wallace reports that in experiments which he conducted in New York during 1909 the

commercial lime-sulphur solution, at a strength of one gallon to thirty gallons of water, did not injure fruit or foliage, and was as effective in controlling apple scab as bordeaux mixture, although the disease was not serious in the orchard treated. Although none of the experiments referred to above were exhaustive, the evidence thus far points to the lime-sulphur solution as a valuable substitute for bordeaux mixture, at least in the treatment of apple scab. Experiments conducted by the Bureau of Plant Industry during 1909 give further evidence of the value of the lime-sulphur sprays as fungicides for summer use. These experiments



Ben Davis trees sprayed with commercial lime-sulphur (2 to 50) showing some leaf injury, Fishersville, Virginia, September 29, 1909



A row of Ben Davis trees sprayed with bordeaux mixture, Fishersville, Virginia, September 29, 1909





York Imperial apple tree sprayed with self-boiled lime-sulphur, showing luxuriant foliage, Fishersville, Virginia, September 29, 1909



Unsprayed York Imperial apple trees almost defoliated by leaf-spot

cover a wide range of conditions, having been conducted in Virginia, Michigan and Arkansas. Eleven varieties were treated. Four different brands of the commercial lime-sulphur solution and a similar home prepared solution were tested at various strengths. The commercial brands registered from 31 to 33 degrees on the hydrometer scale. They were used alone and in combination with arsenical poisons. This paper contains a brief discussion of these experiments with suggestions as to the substitution of lime-sulphur preparations for bordeaux mixture in the treatment of apple diseases.

The acreage in apple orchards in this country is rapidly increasing, and in the future the production of apples will undoubtedly be much greater than at present. The writer is of the opinion, however, that there will be no serious

overproduction, and that there will always be a good demand for good apples, while the poor stuff so common on our markets today will not pay the expenses of handling. It should be the aim of every orchardist to produce and market nothing but first class fruit, and if he does this he may reasonably always expect to obtain good returns from his investment. Spraying is the one operation above every other orchard practice which determines the market value of the fruit produced, and yet in many instances it receives the least attention of all the orchard work. The successful orchardist of the future will be the man who, among other things, studies the conditions existing on his own farm and sprays his trees according to the needs of each variety for the control of the particular troubles which occur in his locality.

The course of treatment best suited for the orchards of the Shenandoah Valley of Virginia may not necessarily give the best results in orchards situated east of the Blue Ridge in that state, and again the treatment for certain varieties of apples may be different from that required for certain other varieties growing in the same locality. The course of treatment should be planned not only with reference to the diseases to be controlled, but also with reference to the probable effect of the fungicide upon the fruit and foliage of the variety to be treated. The Ben Davis, for example, is so seriously russeted by applications of bordeaux mixture that often most of the fruit sprayed with this fungicide is rendered second class. In Virginia this variety does not suffer materially from the attacks of scab, bitter rot or other serious fruit diseases, the leaf-spot, which is easily controlled, being its chief fungous enemy. The Ben Davis, in Virginia and in other similar situations, therefore may be successfully sprayed with a weak fungicide which will control the leaf-spot, sooty fungus and slight scab infections without injury to the fruit or foliage. The York Imperial is another variety which has no serious disease of the fruit, and in addition it is not subject to bordeaux russet so common on the Ben Davis, but the foliage is susceptible to leaf-spot and is often badly injured by applications of bordeaux mixture, so that it is also desirable to spray this variety with a less caustic mixture. On the other hand, the Yellow Newtown is seriously subject to the attacks of bitter rot, and must be treated with a strong fungicide such as bordeaux mixture, for the control of this disease. The fruit of this variety is susceptible to bordeaux injury, but since such injury is produced only by the early applications of the mixture the treatment may be so planned as to avoid it. One of the lime-sulphur sprays may be used for the first and second sprayings after the petals fall and bordeaux mixture for the bitter rot treatments which come later in the season. These are some of the finer points to be considered in connection with spraying, and the orchardist who gives them due consideration will obtain the best results in the production of good fruit.

In Virginia, during the season of 1909, the writer, with the assistance of Mr. Leslie Pierce, conducted experiments with various lime-sulphur preparations in comparison with bordeaux mixture for the control of apple diseases. The experiments were made on the Yellow Newtown, at Crozet; the Winesap, York Imperial and Ben Davis, at Fishersville, and the York Imperial and Ben Davis at Mount Jackson. The self-boiled lime-sulphur mixture, the home-boiled lime-sulphur and the commercial lime-sulphur solution, as well as bordeaux mixture, were used. The self-boiled mixture was used in two strengths, 8-8-50 and 10-10-50, and the home-boiled solution at a strength of five pounds of sulphur



and two and one-half pounds of lime to fifty gallons of water, made by boiling the lime and the sulphur with a small quantity of water over a fire for forty-five minutes. The latter is essentially of the same composition as the concentrated lime-sulphur solution which Professor John P. Stewart described and which, according to him, can be kept indefinitely. The commercial lime-sulphur solution was used at the rates of one and one-half, one and three-quarters, two, and two and one-half gallons to fifty gallons of water. Arsenate of lead at the rate of two pounds to fifty gallons was used with the self-boiled mixture, the home-boiled solution and the bordeaux mixture. The commercial solution was used with arsenate of lead at the rate of two pounds to fifty gallons with paris green at the rate of six ounces to fifty gallons, and without any poison. In the Mount Jackson orchard the trees were sprayed, first, as soon as the petals fell; second, three to four weeks later, and, third, nine to ten weeks after the petals fell. The Fishersville orchard, on account of scab, received an additional application, which was made just before the trees bloomed. The Crozet orchard received the same treatment as the Mount Jackson orchard, and, on account of bitter rot, a fourth application three to four weeks after the third. In the same orchards spraying demonstrations for the control of insects and diseases were conducted jointly by the Bureau of Entomology and the Bureau of Plant Industry, following the schedules of applications just mentioned, which were prepared by Mr. A. L. Quaintance and the writer, the former being responsible for that portion relating to insect control.

One of the objects of these experiments was to determine the effect of the several lime-sulphur preparations in combination with arsenicals on the foliage of different varieties. Several times, at intervals during the season, notes were made on the condition of the foliage of the trees in the experimental plats. The weather was mostly cloudy and rainy from early spring until about July 1, so that the conditions were favorable to the development of spray injury. During the latter half of the season, however, practically no rain fell. In every case, except on the Winesap, where paris green was used with the commercial lime-sulphur solutions, the foliage was badly burned, and in some instances the trees sprayed with this combination lost half of their foliage. The Winesap did not suffer so much injury from this spray, or any of the other sprays, as did the other varieties. This variety was used in the experiments of the previous year, conducted in Nebraska by the Bureau of Plant Industry, and the fact that the commercial solution, at the rate of two gallons to fifty gallons of water and six ounces of paris green, caused only a slight damage to the foliage indicated that the combination might be practicable. It is evident, however, from the Virginia



Apples sprayed with commercial lime-sulphur. Scabby fruit on the right



Apples sprayed with bordeaux mixture. Scabby fruit on the right

experiments that it is entirely unsafe to use paris green with the lime-sulphur sprays. The commercial lime-sulphur solution at the rate of one and one-half gallons to fifty gallons of water and two pounds of arsenate of lead injured the foliage only slightly—scarcely enough to be noticeable to the casual observer. At the rate of two gallons to fifty gallons of water with arsenate of lead, this preparation injured the foliage considerably, so that a small percentage of the leaves dropped off. This injury was manifested by a slight scorching around the margins and at the tips of the leaves, and in some cases by the formation of irregular brown spots. Even here, however, the injury was scarcely more severe than that caused by 3-3-50 bordeaux mixture on the same varieties. At a strength of two to fifty, without any poison, the commercial solution injured the foliage slightly more than the same mixture with the addition of arsenate of lead. The same is true of the one and one-half to fifty strength. The arsenate of lead apparently reduced the caustic properties of the sulphids, rendering the mixture less injurious to apple foliage. This is probably due to the fact that a portion of the sulphur is taken out of the solution to combine with the lead, forming lead sulphid and arsenate of lime. The same solution, at a strength of two and one-half to fifty gallons of water, with and without arsenate of lead, injured the foliage very badly, causing a partial defoliation of the trees. This is much too strong for use in the Eastern States, although Professor Beattie of Washington recommended even a stronger solution.

It appears from these tests that two gallons of the commercial solution to fifty gallons of water is the maximum

strength that can be used on apple foliage with any degree of safety, and that one and one-half to fifty is much safer, and is about as strong as one should risk in spraying a large orchard. The home-boiled solution, containing five pounds of sulphur and two and one-half pounds of lime to fifty gallons of water, with two pounds of arsenate of lead, caused very little, or practically no injury. This is practically the same as the commercial solution diluted to contain two gallons to fifty gallons of water, but the foliage injury caused by the latter was more conspicuous. The self-boiled lime-sulphur and arsenate of lead caused no injury whatever; in fact the foliage sprayed with this mixture had a bright green, vigorous appearance throughout the season. The leaves were noticeably larger, the buds were plumper and the trees made more growth than those sprayed with the other lime-sulphur preparations and with bordeaux mixture. The bordeaux mixture caused considerable spotting and yellowing of the leaves on the York Imperial, Ben Davis and Yellow Newtown, but very little on the Winesap variety. Some of the injured leaves dropped from time to time, so that the foliage on many trees was somewhat thinned out toward the end of the season, but the damage could not be considered very serious.

In the orchards in Virginia where these experiments were conducted none of the apple diseases except leaf-spot developed to a serious extent, so that the test was not a severe one. The apple leaf-spot, so common throughout this state, was entirely controlled by all the mixtures used. The self-boiled lime-sulphur made the best showing in this connection, because it not only controlled the leaf-spot but





Apples sprayed with self-boiled lime-sulphur. Scabby fruit on the right



Unsprayed apples. Scabby fruit on the right

did not injure the foliage, and apparently had a stimulating effect on the trees. All the lime-sulphur preparations, as well as the bordeaux mixture, controlled the sooty fungus and an undetermined "fruit spot" which was common the past season in Virginia. The weather was so dry after midsummer that bitter rot did not develop sufficiently to test the value of the lime-sulphur sprays for its control. Considerable scab developed on the unsprayed Winesaps in the Fishersville orchard, so that a partial test of the efficacy of the several sprays in the control of this disease was afforded. Only one strength (2 to 50) of the commercial lime-sulphur was used on this variety. The crop from four trees in each of the more important plats was picked and sorted, and the results are shown in table I. It will be seen from this table that the scab was held down to less than one per cent of the crop by the commercial lime-sulphur to three and three-quarters per cent by self-boiled lime-sulphur, and to about two per cent by the bordeaux mixture, and that thirty per cent of the unsprayed fruit was affected with the disease. This disease was well controlled by all the mixtures, but it will be noted that it was not particularly bad on the unsprayed trees, so that the test could not be considered a severe one. None of the Winesaps were sprayed with the weaker commercial preparations, nor with the home-boiled lime-sulphur. In this experiment the comparative effect of the different mixtures on the codling moth was determined, and, as shown in table I, the combination of lime-sulphur and arsenate of lead controlled this insect about as well as bordeaux mixture and arsenate of lead. It seems, therefore, that the poisonous action of this arsenical is not reduced

by combining it with the lime-sulphur preparation.

In all the orchards treated the fruit sprayed with the several lime-sulphur mixtures was smoother and more highly colored than that sprayed with bordeaux mixture. The bordeaux mixture russeted the fruit of the Ben Davis so that it did not have the "finish" required for fancy apples, and a small percentage of it had to be discarded as culls on account of the roughened appearance due to the mixture. The Yellow Newtowns were russeted considerably and the Winesaps only slightly, while the York Imperials showed practically no russet effect. The lime-sulphur preparations caused no russeting, or at most very little, where the strongest solutions were used, and the fruit sprayed with these mixtures was smooth, clean and well colored. The difference in color between the fruit sprayed with the bordeaux and that sprayed with the several lime-sulphur preparations was very striking, and this feature alone would make the latter sprays preferable to the former if other things were equal.

Experiments similar to those in Virginia were conducted at Douglas, Michigan, in co-operation with the Bureau of Entomology, and the results

were much the same. The work was done by Mr. R. W. Braucher, under the writer's direction, in the orchard of Mr. C. W. Gaylord. The trees were sprayed just before they bloomed (May 19 and 20), as soon as the petals fell (June 1 and 2), three weeks later (June 23 and 24) and ten weeks after the petals fell (August 10 and 11). There were six plats of from thirteen to twenty trees each, including the Wagener, Baldwin, Rhode Island, Roxbury and Ben Davis varieties. The commercial lime-sulphur solution, diluted to contain two gallons to fifty gallons of water, without any arsenical, was applied to plat 1; the same solution, with the addition of six ounces of paris green, was applied to plat 2, and the same solution, with the addition of two pounds of arsenate of lead, was used on plat 3. Plat 4 was sprayed with self-boiled lime-sulphur (10-10-50) and two pounds of arsenate of lead, and plat 5 was sprayed with 3-4-50 bordeaux mixture and two pounds of arsenate of lead, while plat 6 was left unsprayed. The plats sprayed with the commercial lime-sulphur solution, especially plat 2, began to show considerable foliage injury after the second application, and on this account the solution was diluted to contain only one gallon to forty gallons of water for the last two sprayings.

Soon after the second application was according to Mr. Braucher's notes, the commercial lime-sulphur plats began to show foliage injury. Notes made at intervals during the season show that the foliage was quite badly injured by the lime-sulphur solution and paris green combination, and that solution without an arsenical caused almost as much damage, while the same solution with arsenate of lead was much less injurious. Although the damage caused by the lime-sulphur and arsenate of lead combination was not severe it was sufficient to discourage the use of the solution at the strength of two gallons to fifty gallons of water. A strength of one and one-half gallons to fifty gallons of water, with arsenate of lead, proved to be practically non-injurious in Virginia, and probably would be safe in Michigan. The self-boiled lime-sulphur mixture, with arsenate of lead, caused no damage whatever. Table II shows the efficiency of the several spray mixtures in preventing apple scab on the Wagener variety, as determined by sorting

TABLE I—RESULTS OF THE USE OF LIME-SULPHUR PREPARATIONS AND BORDEAUX MIXTURE WITH ARSENICALS IN THE PREVENTION OF SCAB AND CODLING MOTH INJURY ON WINESAP APPLES IN VIRGINIA

No. Plat	Spray Mixture Used	Scabby Fruit Injured by	
		Fruit Per Cent	Codling Moth Per Cent
2	Commercial lime-sulphur solution (2 to 50) and paris green.....	0.63	6.90
3	Commercial lime-sulphur solution (2 to 50) and arsenate of lead....	.51	1.25
4	Self-boiled lime-sulphur solution (10-10-50) and arsenate of lead....	3.75	1.40
6	Bordeaux mixture (3-3-50) and arsenate of lead.....	2.15	.53
8	Check—not sprayed .....	30.27	36.70

TABLE II—COMPARISON OF RESULTS OF THE USE OF LIME-SULPHUR SPRAYS WITH BORDEAUX MIXTURE IN THE PREVENTION OF SCAB ON WAGENER APPLES AT DOUGLAS, MICHIGAN

No. Plat	Spray Mixture Used	Scabby Fruit	
		Per Cent	Per Cent
1	Commercial lime-sulphur solution (2 to 50) .....	6.37	
2	Commercial lime-sulphur solution (2 to 50) and 6 ounces of paris green....	2.23	
3	Commercial lime-sulphur solution (2 to 50) and 2 pounds arsenate of lead.	3.96	
4	Self-boiled lime-sulphur solution (10-10-50) and 2 pounds arsenate of lead.	19.48	
5	Bordeaux mixture (3-4-50) and 2 pounds of arsenate of lead.....	3.43	
6	Check—not sprayed .....	81.18	



and counting the fruit from eight trees in each plat. As shown in the table, the scab was held down to an average of 4.2 per cent of the crop by the commercial lime-sulphur solution, to 3.43 per cent by the bordeaux mixture, and to 19.48 per cent by the self-boiled mixture, while eighty-one per cent of the unsprayed fruit was scabby. This experiment, as well as those conducted in Virginia, shows that the lime-sulphur solution is as effective in preventing apple scab as bordeaux mixture, while the self-boiled wash is not so good in this connection. The arsenate of lead in the commercial lime-sulphur solution held the codling moth down to 1.6 per cent of the crop, and in the case of bordeaux mixture to 5.6 per cent, thus indicating that the lime-sulphur does not injuriously affect the poison.

At Siloam Springs, Arkansas, during 1909, Messrs. F. W. Faurot and E. L. Jenne of the Bureau of Entomology conducted another set of experiments under the writer's directions. The results of those experiments throw considerable doubt on both the efficiency and safety of the commercial lime-sulphur solution as a summer spray for apple diseases. The Ben Davis, Shannon, Arkansas and Elkhorn varieties were sprayed with several different strengths of the commercial preparation in combination with arsenical poisons. The self-boiled lime-sulphur solution and the bordeaux mixture were also used. The trees were sprayed five times, as follows: (1) As soon as the petals fell, (2) three weeks later, (3) eight to nine weeks after the petals fell, (4) two weeks later and (5) three weeks after the fourth application. The trees sprayed with commercial lime-sulphur solution, diluted to contain one gallon in thirty gallons of water, with the addition of the usual amount of arsenate of lead, showed very little, or practically no foliage injury after the first and second applications; in fact, according to notes made on June 30 and July 22, no serious injury followed the third treatment, which was applied on June 2. After the fifth application, however, the injury increased rapidly, and at picking time half of the leaves were



Spraying in the orchard of W. F. Hurst, Boise, Idaho

on the ground. It seems that the injurious effect of the mixture was cumulative, the injury being increased by each application. Three applications perhaps would have resulted in little or no damage, but five sprayings were evidently more than the trees could stand. Considerable rain fell during May and June, but the remainder of the season was dry. The trees suffered severely from drought, which apparently exaggerated the spray injury. On account of the shortage of foliage on the trees a portion of the fruit was sunburned, but no russetting was caused by the spray. This sunburning also occurred on the fruit sprayed with bordeaux mixture, but to a much less extent.

The commercial lime-sulphur, at a strength of one to thirty, in combination with paris green, began to burn the foliage soon after the first application was made, and by midsummer the trees were almost bare. Arsenite of lime was also used with the one to thirty solution, and the results were disastrous. The foliage was burned to a crisp and the fruit badly scorched by

the first application. Even the new twig growth was killed to a considerable extent. The self-boiled lime-sulphur and arsenate of lead caused no injury to fruit or foliage. The fruit sprayed with bordeaux mixture was quite badly russeted and the foliage suffered considerable injury. The lime-sulphur sprays failed to control apple blotch, which is the most troublesome disease of that section. About ninety-five per cent of the unsprayed fruit was affected with blotch, and about forty per cent of the fruit sprayed with the self-boiled wash was so affected. The commercial solution at one to thirty gave only slightly better results, while bordeaux mixture almost completely controlled the disease. Bitter rot, though not very serious in the experimental orchard, was only partially controlled by any of the lime-sulphur sprays, while bordeaux mixture held it thoroughly in check. It seems from the test that the lime-sulphur preparations are of very doubtful value in the control of apple blotch and bitter rot, but, of course, further tests are necessary before final conclusions can be reached.

The writer feels that the information at hand is not quite sufficient upon which to base final conclusions and recommendations. It seems evident, however, that a lime-sulphur preparation in one form or another is destined largely to take the place of bordeaux mixture in spraying varieties of apples subject to serious injury from applications of the latter. A lime-sulphur solution containing, when diluted, about four pounds of sulphur to fifty gallons of water appears at present to be the most promising preparation. This may be obtained by using the commercial solution at the rate of one and one-half gallons to fifty gallons of water, or by preparing the lime-sulphur solution at home and diluting it so that each fifty gallons will contain four pounds of sulphur. The mixture



Apple scab on fruit and leaves





Individual bush of dewberry vines, being one of a row between two-year-old trees on a five-acre orchard, which row produced \$116 worth of berries. The dewberry is of course a very good shipper and has been one of the most used sources of income for the young orchardists

at this strength injured apple foliage in Virginia very little, and if these results could be taken as a reliable guide there need be no hesitancy in using it, but under different conditions the results might be different, and the matter must still be considered as more or less experimental. A strength of one and one-quarter gallons of the commercial solution may prove to be sufficient in most cases, and the danger of injury would then perhaps be entirely eliminated.

Our experiments of 1908 and 1909, as well as the published records of other investigators, show that the lime-sulphur solution is apparently as effective as bordeaux mixture in the control of apple scab. Under more severe conditions than those which existed in the experimental orchards the treatment might fail, but at present it is very promising. Lime-sulphur will control leaf-spot and other minor troubles, as well as apple scab, but so far it has not proved to be a satisfactory remedy for apple blotch and bitter rot. However, the experiments on those two diseases have not been carried far enough to determine what may be expected of it in this connection. In sections where spraying for bitter rot is required the lime-sulphur treatment for scab and leaf-spot could be followed by applications of bordeaux mixture for bitter rot. The self-boiled lime-sulphur is entirely harmless to apple foliage, and apparently has a stimulating effect, but it is not as effective against scab as the boiled wash. Our experiments show that it will control mild cases of scab and will entirely prevent leaf-spot, "fruit-spot" and the sooty fungus, but in sections where scab is a serious disease this wash probably would be inefficient. In the Shenandoah Valley of Virginia, where scab rarely occurs except in a mild form, and under sim-

ilar conditions elsewhere the self-boiled lime-sulphur would perhaps be preferable to either the boiled wash or bordeaux mixture.

According to the information at hand arsenate of lead is unquestionably the poison to use with the lime-sulphur mixtures. Instead of increasing the caustic properties of the mixture, as at first feared, it apparently has the opposite effect to some extent, and does not lose any of its insecticidal value by reason of the combination. In all the experiments the combination of paris green and the lime-sulphur solution proved to be quite injurious to apple foliage, and in the Arkansas work the

combination of arsenite of lime and lime-sulphur was exceedingly injurious. According to the results obtained in the Arkansas experiment, three applications of the commercial solution at a strength of one gallon to thirty gallons may be made without material injury to apple foliage, but after the fourth application the injurious effect becomes serious, and after the fifth the injury is almost disastrous to both fruit and foliage. It appears, therefore, that the injury is cumulative and that it is unsafe to make more than three applications, or four if one is made before the trees bloom.

It is at present more difficult to make satisfactory recommendations for spraying apple orchards than it has been for years. Until recently bordeaux mixture was pre-eminently the best known fungicide for use on the apple, and it was comparatively easy to outline a course of orchard spraying for a given locality, but the advent of new fungicides which, though insufficiently tested, give promise of doing the good work of bordeaux mixture without its harmful effects, makes the problem more difficult until further experiments shall have shown the exact value of these new preparations. The writer is of the opinion, however, that the information at hand is sufficient to warrant making substitutions for bordeaux mixture under certain conditions, thus avoiding as much as possible the very undesirable fruit russetting and foliage injury produced by this fungicide. The following tentative outlines for the treatment of diseases of different varieties of apples are suggested: On varieties subject to attacks of apple scab, especially in districts where this disease prevails, use a reliable commercial lime-sulphur solution (registering about 32 degrees on the Baume scale) at the strength of one and



Scene in the packing house of the O. G. France ranch, where from 12,000 to 15,000 boxes of apples are packed each year



one-half gallons to fifty gallons of water or an equivalent strength of the home-boiled solution, with two pounds of arsenate of lead. Spray the trees (1) just before they bloom (after the cluster buds open), (2) as soon as the petals fall, (3) three to four weeks after the petals fall, and (4) nine to ten weeks after the petals fall. This course of treatment is intended for the control of apple scab, codling moth, leaf-spot and other minor troubles. In the treatment of varieties not seriously subject to scab, or, in districts where this disease is not prevalent, the application before the trees bloom may be omitted, making only three applications in all. On varieties requiring treatment for bitter rot the lime-sulphur

solution and arsenate of lead may be used in the two or three early sprayings and bordeaux mixture (3-4-50) and arsenate of lead in the applications required for bitter rot, about nine weeks after the petals fall and at intervals of two or three weeks until three applications shall have been made. On such varieties as the York Imperial, Grimes, Ben Davis, Gano and Wealthy, located in Virginia, West Virginia, Maryland and other similar sections where these varieties suffer very little or not at all from attacks of scab, the self-boiled lime-sulphur mixture (8-8-50), with arsenate of lead, may be used with complete success. Spray the trees (1) as soon the petals fall, (2)

three to four weeks after the petals fall and (3) nine to ten weeks after the petals fall. This course of treatment will control the apple leaf-spot, mild cases of scab and other minor troubles, as well as the codling moth. The advantage of this mixture over the boiled solution is that it is absolutely harmless to fruit and foliage, while the use of the latter is attended with some danger of foliage injury. After another year's experiments the courses of treatment here specified will doubtless have to be revised. They are suggested as a guide in spraying apple orchards until further information on the comparative value of various sulphur sprays can be obtained.

## Fruit Trees Damaged by the Red Spider

By Professor R. Edward Trumble, Wenatchee, Washington

THE red spider is doing some of our growers in the Wenatchee Valley considerable damage, and no doubt many other regions in this state are suffering from the injuries due to this inconspicuous little pest. On the whole the very obscurity of the injury, and even the pest itself, increases the losses due to the red spider because growers so often overlook it. Last summer the red spider was the most serious pest we had on young trees. While its attacks are by no means limited to young trees, it does its greatest damage on two, three and four-year-old trees. Often one-half or more of the leaves will be so badly affected that they will fall from the trees, thus limiting the tree's nourishment and checking its growth. If the leaves are all covered with red spiders the tree has a hard struggle to live and is sometimes killed. All growers who have trees thus affected should begin studying to eradicate the pest.

The eggs of the red spider are about the size of the point of a pin, just visible to the naked eye. They are round, transparent, pale whitish bodies that turn pale red a few days after hatching. They are fastened by a glue-like substance and take from one to two weeks to hatch, according to the warmth of the weather. They are fastened mostly on the leaf stems and veins. The young spider is red until about two days old, then it molts its skin, and is then a pale yellow or pale green. Bunches of these white shells seen on the leaves are the molted skins. The wintering over eggs begin hatching at the appearance of the first leaves and blossoms. Hatching is continued for more than a month. The spider has six legs when first hatched, and the fourth pair appears after molting. The mature spider turns red. It lives from three to four weeks during the summer, and molts three times. Generation after generation of the spiders appear during the summer months, and at all times of the season eggs and all other stages of the spider may be found upon the leaves. From the first of August to

the latter part of September the mature spiders descend to the ground; this is regulated by the approach of cool days. Here it hibernates during the winter under clods of dirt and in cracks of the earth. The few that survive the winter ascend the trees and deposit their eggs on the leaves.

The injury on the leaves is seen in hundreds of small spots of pale green and brownish yellow. The spots, from half a pin head size and larger, are where the spiders have torn the skin of the leaves to get the sap. As the spiders hatch they form their webs, principally on the undersides of the leaves, and under this protection they feed. The web provides the quickest means of ascertaining whether your trees or plants are affected. These webs gather and hold much of the dust that blows against them, soon making the leaves

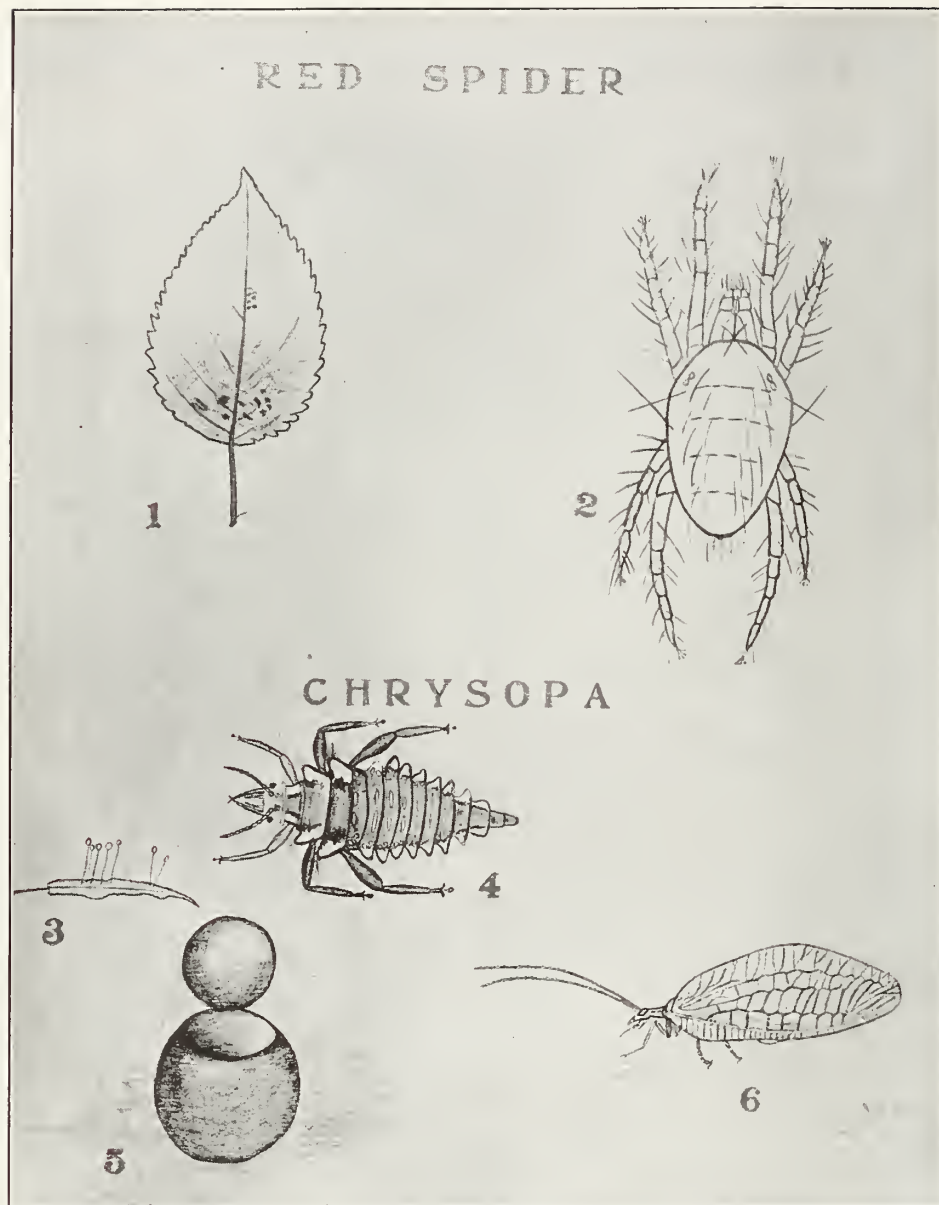
look a dirty and darker green than is normal. Webs are built at the base of the trunk and are always fastened out on the ground, and in some cases are up the trunk from two to six inches. They are close knitted, whitish structures, usually alive with the spiders. Where the trees have been infested a few seasons the injury to the tree becomes very apparent. All deciduous fruit trees, raspberry, currant, blackberry and all cultivated bramble bushes are infested; shade trees, willows, and even grass and weeds are attacked by them.

Remedies.—For comparison, I tried practically all the known remedies for red spider in W. T. Clark's orchard. The formula given below was the only one tried that gave complete satisfaction. It is peculiar that sprays effective against aphids and other soft bodied



General view of the Wenatchee Valley, looking north, with the famous Turner orchard and Millerdale in the foreground and the confluence of the Wenatchee with the Columbia River in the background, also Birch Flats





Drawn by R. Edward Trumble

The leaf drawing, No. 1, shows a small group of red spider eggs near the middle vein. The dots near the edge represent the light spots on the leaves, the red spider injuries. The lower part of the leaf shows the characteristic dirty web structure under which the spiders hide. No. 2 is a mature red spider magnified about seventy-five times. The four lower drawings are of chrysopa, commonly called the golden eyed lace wing. This is the greatest natural enemy of the red spider. No. 3 shows the eggs upon little thread-like structures. This is done so that the first larva that hatches cannot eat the others. The egg hatches into the larva—No. 4. The larva kills thousands of red spiders, and when mature goes into a globular pupa case—No. 5. Later the pupa case breaks open and the mature insect, No. 6, emerges and lays eggs on the leaves or fruit of trees infected with red spider. No. 4 is three times natural size, No. 5 about seven times natural size. No. 6 is about two times natural size.

insects are quite ineffective against this pest. The following formula can be relied upon to kill all the red spiders on the trees if thoroughly applied: 150 gallons water, 50 pounds flowers of sulphur, 2 pounds whale oil soap and 6 pounds whole wheat flour made into a paste. To make flour paste in large quantities place the exact number of pounds of flour needed for the desired quantity of spray in a box which has a screen bottom. Place over cooking vat. Pour water, at the rate of one gallon to each pound of flour, through the flour. Do this until the flour is mixed smoothly and is free from lumps. The flour paste makes the spray stick, so that it has an action over a period of three to five weeks, sufficient to kill all living spiders and the future young as they hatch. Boil the soap in water

at the rate of one gallon of water for each pound of soap. The soap is necessary to make the sulphur mix with the water. It also tends to form a film of spray over the leaves. Agitate ten or twelve minutes before starting to spray. Don't vary, however slightly, this formula, for its action may be changed.

Don't spray on the ground in large quantities, or use in a period of damp weather, without the addition of eight or ten pounds of lime made into milk of lime. Moisture and warmth for several days will cause the formation from the flowers of sulphur of injurious quantities of free sulphuric acid. The milk of lime will prevent this by reacting with the sulphuric acid. Keep up the pressure so that a driving spray leaves the nozzle. This is necessary in order to break the webs, and be sure to

thoroughly spray the leaves under the webs. Since most of the webs and spiders are on the under sides of the leaves, it is necessary to direct the spray up a good share of the time. The spray nozzle must be bent at an angle of thirty to forty-five degrees to the extension rod in order to do perfect work. One careful treatment will kill all the pests on the tree, but the spraying must be thoroughly done. The usual method of going over a tree will do little good. To completely control the red spider it is necessary to kill them in the ground as well as upon the trees, for there are usually enough spiders in the ground about the trees for a continued infection of the tree. Realizing that the spiders must be killed in the ground as well as upon the trees, I have been experimenting for some time to find a means of killing them in the ground. Last summer I succeeded in working out a solution that does the work, and have named the solution "Red Spider Exterminator." This material is manufactured for the trade by the Rex Spray Company of Wenatchee. A small quantity of this solution put in the ground around the base of the tree kills the hibernating red spiders almost immediately, and does a thorough job. By giving the ground treatment and the tree treatment at the same time, when the pests became numerous, orchards in the Wenatchee Valley have been completely freed from this pest. Now that we have a method of completely controlling red spider, I hope to see the leading fruit regions soon free from its destructive work.

#### FRUITS RECOMMENDED FOR PLANTING IN WESTERN WASHINGTON

In answer to the many inquiries which are being received, the Horticultural Department of the State Agricultural Experiment Station at Pullman, Washington, has prepared the following list of fruits for planting in that part of the state lying west of the Cascade Mountains. In many cases the varieties to be recommended for planting in other parts of the state are different, and will be found in other lists. The following list does not include all the varieties which might be planted, but those which experiments and practical bearing orchards have shown to be desirable for general planting. The letter (E), (M), and (L) following the names indicate early, mid-season and late ripening varieties, respectively. The varieties are arranged alphabetically in each case:

**Apples**—Gravenstein (M), Grimes Golden (L), King (M), Northern Spy (L), Olympia (L), Ortley (L), Wagener (L), Yellow Bellflower (L), Yellow Newtown (L), Yellow Transparent (E).

**Pears**—Anjou (M), Bartlett (E), Clairgeau (L), Comice (M), Flemish (M), Seckle (M), White Doyenne (M), Winter Nelis (L).

**Sweet Cherries**—Bing (M), Black Republican (L), Hoskins (L), Lambert (L), Royal Anne (E).

**Sour Cherries and Dukes**—Early Richmond (E), Montmorency (M), Northwest (L), Olivet (M), May Duke, Late Duke, Reine Hortense.

**Peaches**—Alexander (E), Charlotte (E), Early Crawford (E), Triumph.

**Apricots**—Gibb (E), Moorpark (E).

**Plums**—Abundance, Bradshaw, Peach and Wickson.

**Prunes**—Hungarian, Italian, Silver.

#### COMMON GRAFTING WAX

Resin, four pounds; beeswax, two pounds; tallow, one pound, melted together, forms the stock solution, and when using thin with turpentine, according to weather conditions. If real cold it will require more turpentine, and if real warm it will need but little or no turpentine. Add turpentine by remelting a part of the stock solution.





A three-year-old orchard grown without irrigation in Harney Valley

## Some Hawaiian Tropical Fruits

By J. Edgar Higgins

**T**HE mango has been called the "king of tropical fruits." The majestic trees and the luscious fruits both justify the title. The tree, with its long dagger shaped leaves, rears its lofty head forty, fifty or even sixty feet in the air, and presents a solid phalanx of never-failing green to the tropical sunshine. At the tips of the branches appear the cone shaped clusters of brownish yellow flowers, which gradually lengthen and become lighter in color until the miniature mangoes are formed. This occurs in Hawaii at about the beginning of the new year, for it will be remembered

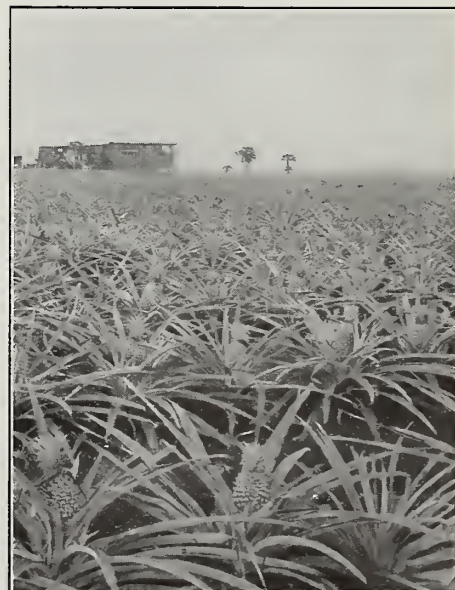
that there is no winter in the land of the mango. In June, July and August the mango crop is at its height, and the small boys may be seen with unnaturally distended blouses, both clothes and boys full of the ripe fruit. Everyone in the tropics is familiar with the mango, but not everyone knows it in its finer varieties, while to the people of the temperate zone it has been so unknown as to be at times spoken of as "a mass of tow and turpentine." It is true that some of the commoner seedling varieties have a flavor quite suggestive of turpentine, which renders them unattractive at first to the average newcomer. They also contain too much fiber, which is inconvenient in eating them. These are the forms that the traveler encounters, and have given rise to the evil reputation referred to above. But it would be as correct to judge apples by the small sour seedling forms used in the manufacture of cider as to describe the mango by its seedlings. The finer varieties which are propagated by budding and grafting are among the most beautiful and luscious of fruits, appealing at once to the eye and taste. The stronger and turpentine-like flavors of some of the seedling varieties frequently demand an acquired taste and are highly prized by those of long residence in the tropics. But some of the grafted varieties require no introduction. Their beauty of form and color entice one to closer intimacy, and their fineness of texture and delicacy of flavor at once captivate.

That any fruit so excellent should be so little known even where it grows readily will appear strange to those who are familiar with the fruits of the

American temperate zone, but it must be remembered that commercial fruit growing in the tropics is as yet in its infancy. Apart from the banana, the pineapple, and perhaps a few other species, there can scarcely be said to be any tropical fruit industry. It is only necessary to go back a few generations in the history of American horticulture to find approximately the same condition prevailing relative to the apple, the peach, the pear and the plum. Though the mango has been cultivated in India for centuries comparatively little attention has been given to methods of propagation, so that until recently the awkward but interesting



A grafted mango tree in fruit, Honolulu, Hawaiian Islands



A pineapple field, Wahiawa, Oahu, Hawaiian Islands



method of grafting by approach, or inarching, has been practically the only method of propagating a good variety with certainty. The process in inarching would appear to the American orchardist to be slow and tedious. A vigorous seedling mango about a year old and growing in a pot or box is brought close to a branch or twig of the tree of the desired variety. This may necessitate the building of a stand or small platform upon which to elevate the seedling if the older tree is high. A thin slice of bark and wood is cut from the twig, and also from the seedling. The two wounded surfaces are brought into contact, tied, waxed and allowed to so remain until they have grown together. The twig is now cut from the parent tree, and in the future will draw its life from the roots of the seedling. The top of the seedling is cut off close to the point of the union and the desired end is accomplished—a fine variety has been grafted on a seedling stock. Science has recently come to the aid of the mango growers and has demonstrated the possibility of budding mangoes by the method known as "patch budding." An orchard of seedling mangoes can be set and the trees, when two or three years old, can be budded to any varieties desired, just as a young orchard of apples in the temperate zone may be top-worked by grafting. This will mean much for the development of the mango industry. In the future this fruit of the sunny climes will certainly find its way into all the important American markets. It has already been demonstrated that it can be shipped in refrigeration.

The avocado is sometimes erroneously called the "Alligator pear," a very inelegant and uninviting term, which doubtless has arisen from the peculiar

checked character of the rind of this fruit which sometimes occurs, and which bears some resemblance to alligator skin. This name is passing out of use and the fruit is now known as the "avocado." This is one of the most unique of tropical fruits. It consists of a large fleshy seed, surrounded by the pulp, which, when ripe, is about the consistency of firm butter and is of a rich nutty flavor. The fruit is covered with a thick rind, green, purple or brown in color. It varies in size from that of a large Bartlett pear to that of a large egg plant and assumes a great variety of shapes. The tree is about the same size and of somewhat the same habit as a standard Bartlett pear. Usually the taste for the avocado must be acquired. Few are fond of it at first, but no taste is acquired more rapidly. Two or three attempts are sufficient to convince the experimenter that such fruit is too good to be passed by upon the menu. The avocado lends itself to several culinary uses. It excels as a salad. The pulp is cut through with a knife, the fruit opened and the seed slipped out and thrown away. The edible portion may thus be served as a salad with salt, pepper and vinegar or lime juice, or it may be removed from the rind, cut into smaller sections and dressed with oil. A half or quarter section may be served on the side with soup. The pulp is removed with the spoon and placed in the soup if desired. Some are very fond of the avocado as a dessert. As such it is placed on the table in halves or quarters and is eaten with sugar. The demand for the avocado is so far in excess of the supply so that even in Hawaii, where it is grown, it sells for high prices. In San Francisco the wholesale price is about \$2.50 per dozen when the fruit is available. A

few small shipments of avocados have been made from time to time from Hawaii, Tahiti and Mexico to the San Francisco market. It will be only a question of time until this fruit will be found in all the chief markets and at prices to place it within the reach of any family of moderate income.

The pineapple does not grow on a tree, nor is it any more closely related to the apple than is the so-called "Alligator pear" to the true pear. It is borne on a small plant not more than one and a half or two feet high and comes to maturity within a year and a half from the time when the plant is set out. Planting the crown from the top of the fruit is one of the common means of propagation. The lower leaves are pulled off from the crowns, which are then planted in rows from three to five feet apart and the plants about two to three feet apart in the rows. Some plant in beds six or eight feet apart. These cuttings or slips do not need to be planted at once when removed from the fruits, but may lie in the sun for days and suffer no harm. When planted they do not form roots immediately, but remain apparently dormant for several weeks. Then new green leaves begin to appear in the center of the crown and are followed by others, the plant in the meantime increasing slightly in height until a miniature pineapple appears in the middle of the rosette of leaves and covered with small pale blue flowers. Then it becomes apparent to even the casual observer that the pineapple is not a single fruit, but like the raspberry, the strawberry and many others, is composed of a large number of fruits crowded closely together. Next to the banana, the pineapple is perhaps the best known of tropical fruits in Northern markets. Many, however, fail to get its best qualities. The fresh fruit should be peeled with care to remove all the "eyes," the pulp should preferably be broken from the core with a silver fork, then placed in a glass dish in alternate layers with sugar, and should be put on ice for several hours. It is a most luscious fruit. The pulp is often used in sherbets and ices.

#### APPLE PRODUCTION

The following table shows the production of apples (barrels) in the United States during the last few years:

1895.....60,153,000	1903.....46,625,000
1896.....69,070,000	1904.....45,360,000
1897.....41,536,000	1905.....24,310,000
1898.....28,570,000	1906.....38,280,000
1899.....58,466,000	1907.....29,540,000
1900.....56,820,000	1908.....25,450,000
1901.....26,970,000	1909.....22,735,000
1902.....46,625,000	1910.....24,000,000

#### Editor Better Fruit:

We are glad to note your increased circulation and your deserved success for getting out such a high class publication. You are giving a great educational service along with an advertising value to those who use your medium, of which you can justly be proud, and we sincerely congratulate you and wish you continued success. Yours truly, Produce Reporter Company, Chicago.

#### Editor Better Fruit:

Enclosed find check for one more year of the best fruit paper published. It ought to be worth one dollar a copy instead of one dollar a year. Sincerely yours, C. E. Mincer, Hamburg, Iowa.



A group of mango trees, Honolulu, Hawaiian Islands



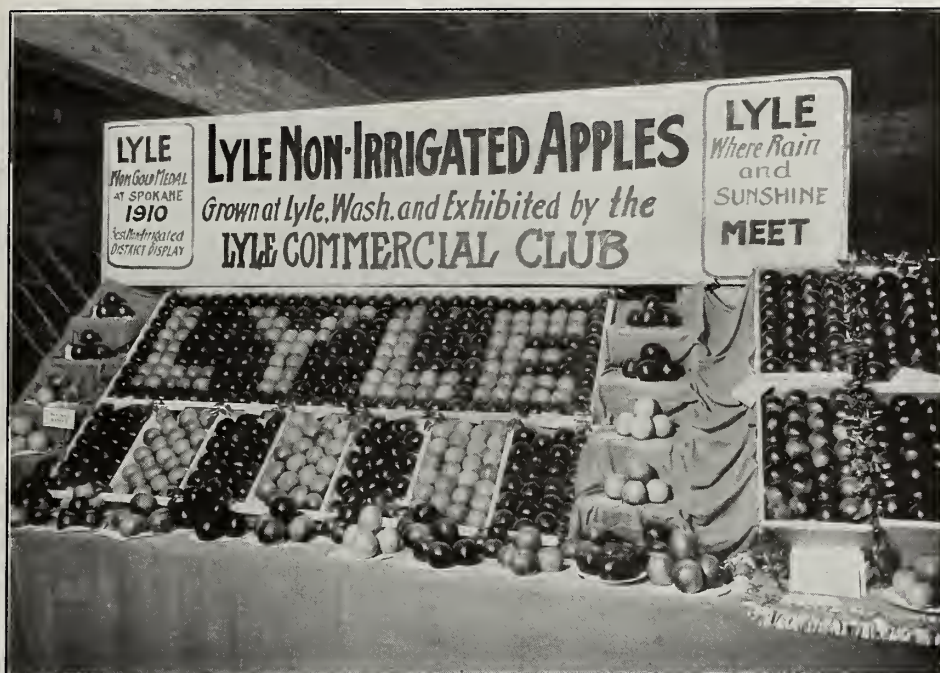


Exhibit of the Lyle Commercial Club at the Oregon State Horticultural Society, 1911, winning a diploma for best district display

## How to Nourish the Cherry Tree

By E. A. Season, Tacoma, Washington

**T**HERE are few adult persons living in the farming regions who cannot recollect the annual cherry pickings, how the boys and girls, and even the men and women, with baskets or tin pails, climbed the red-burdened trees and vied with each other in the harvest of the luscious fruit. Now that cherry picking time will soon be here, let us consider the reasons why the crops are becoming less bountiful and the fruit deteriorating in quality.

The blossoms usually were in great profusion and the promise of a large crop seemed assured; yet after a few weeks the ground was strewn with immature fruit, and the trees bore the mark of insect and fungous pests, while the scattering cherries remaining upon the trees until time for ripening looked misshapen and were inferior in quality. Large orchards, once a source of considerable revenue, have been sacrificed through ignorance of their requirements. These conditions have been greatly deplored by growers, many of whom lack the energy to look into the cause and to combat the enemies of a favorite fruit.

That food for the needs of the tree is required becomes evident by the dropping of immature fruit bearing no marks of insects and of the imperfect condition of that remaining until time of ripening. As in the case of all fruit-bearing trees, there is really produced annually a double crop—that of the leaves and later that of the fruit with its seed, which must necessarily consume great quantities of the natural store of plant food constituting the fertility of the soil; hence where this process goes on year after year exhaustion of the elements of plant food must inevitably result.

Added fertility is seldom considered in connection with the fruit trees on the farm and cultivation of the orchard is neglected, so that the ground becomes each year more and more infested with insect pests which prey upon the starving trees.

From the time of setting the young trees until their full bearing age is reached good, vigorous growth should be maintained. The plowing under of clover or green crops usually will furnish sufficient nitrogen unless lack of good color or growth of young wood shows its need. The mineral elements, however, must be supplied in the form of commercial fertilizer unless the soil is a volcanic ash, and contains them in sufficient available quantity. The following formula is a good one:

Nitrogen, 2 per cent; available phosphoric acid, 7 per cent; actual potash, 9 per cent.

Application should be made of from eight to sixteen pounds per tree, depending upon its size, in the spring, and the fertilizer well worked into the soil. By keeping hogs or poultry in the orchards the insects which infest the soil through stung or fallen fruit may be largely eradicated.

Cherry trees which were considered worthless have been restored to abundant bearing by proper fertilization and the controlling of destructive insects.

### Cherry As A Profitable Crop

By Charles H. Miller, Colorado

**T**HE cherry crop I refer to is the product of twenty trees in full bearing. The variety is Early Richmond. The crop I am telling about was gathered in the year of 1908. The average product in 1908 of the twenty trees was twenty-eight grape baskets per tree, or

seven crates, which sold very readily for 50 cents a basket, or \$2 per crate; we only kept account of what was actually sold on the market, not taking into consideration what was used for canning, pies, those eaten by the birds, etc. By selling them at 50 cents a basket, or \$2 per crate, makes an average of \$14 per tree, and figuring 160 trees per acre, which puts the trees sixteen and one-half feet each way, and, according to my opinion, is the ideal distance. Figuring \$14 per tree, 160 trees would bring \$2,240 per acre, and I am considering the Early Richmond, the poorest seller, and the trees that I refer to were a little below the average of what they should be with proper care.

The cost of planting an acre of cherries depends on circumstances. I will not attempt to give a certain set of figures, but no man should attempt to set out anything but a strictly first-class tree, as all others are too expensive. First-class cherry trees cost from 25 cents to 35 cents a tree, and from my experience a good thrifty man can make good wages and interest on money invested in planting ground between the trees to cultivated crops; cultivating crops between the trees is a benefit rather than an injury, as what a man can make out of cultivated crops between trees depends altogether on the man, I am only arriving at a medium estimate. Cherry trees begin to bear fruit at from four to five years of age. I prefer to let everyone figure for himself what a cherry orchard will do after it comes into full bearing. I know of a tree that I planted in 1892 in this valley that yielded fifty-three baskets of cherries this same season that sold for 60 cents per basket. One common mistake that most cherry growers make, and which I consider a serious mistake is, most people pick their cherries before they are quite ripe, thereby injuring the market value of same, as all cherries are always more or less bitter before they are ripe, which is not the case after they are ripe. Besides, they are so much larger when fully ripe and also have a pleasant flavor. This applies to all varieties of cherries.

One can never think of Oregon without recalling the "Hood River Apples." The new pear district at Medford and other fruit districts indicate what will follow with the removal of great timber tracts. More small farms have been opened the past year than ever before, and the young farmers are made welcome. The mild climate of the state has attracted many thousands of new settlers, and there is never fear of drought—in winter time, at least when the winter mists begin to fall and the American roses begin to bloom in the gardens.—National Magazine.

#### Editor Better Fruit:

We have your enclosure and beg to herewith hand you check for another year's subscription. We would certainly feel lost if we did not get your publication regularly each month, as we don't know of any publication, no matter what the price, which we would prefer to yours. Yours very truly, Finks Brokerage Company, Austin, Texas.



# Apples Recommended for Planting Commercial Orchards

J. L. Dumas, Pullman, Washington

Key to Abbreviations—*Form*: e, conical; o, ovate; obl, oblong; r, round. *Size*: Numbers indicate smallest and largest number of commercial pack in a Northwest standard box. *Color*: b, blushed; c, crimson; d, dark; g, green; p, pale; r, red; ru, russet; s, striped; w, white; y, yellow. *Flavor*: a, acid; b, brisk; m, mild; p, pleasant; r, rich; s, sweet; sa, sub-acid. *Quality*: 50 credits for dessert, 25 for cooking, and 25 for market; total 100. *Planting recommendations*: \* Indicates success; \*\* highly successful; blank, not reported upon.

Variety	Origin	Form	Size	Color	Flavor	Dessert		Cooking		Total	Recommendations for the Several Districts																	
						(50)	(25)	(50)	(25)	(100)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Early Harvest.....	America.....	rob	225-128	py	sa	45	20	15	80																			
Red June.....	North Carolina.....	obl	225-112	yc	msa	45	15	15	75																			
Red Astrachan.....	Russia.....	re	175-96	isc	a	34	25	16	75																			
Yellow Transparent.....	Russia.....	rob	200-110	py	sa	39	21	16	76																			
Fameuse.....	Canada (?).....	rob	250-140	gyre	sa	45	18	20	83																			
Jeffries.....	Pennsylvania.....	obl	225-96	gyre	rmsa	49	18	20	87																			
Oldenburg.....	Russia.....	rob	200-128	gyre	ba	35	20	18	75																			
Gravenstein.....	Germany.....	rob	150-72	rys	sa	38	25	18	81																			
Longfield.....	Russia.....	obl	165-80	yb	sa	40	20	15	75																			
Maiden Blush.....	New Jersey.....	rob	175-96	pyb	sa	38	23	18	79																			
Fall Pippin.....	America.....	obl	150-80	yg	psa	42	22	16	80																			
Wealthy.....	Minnesota.....	rob	150-96	wrsc	bsa	37	15	22	74																			
Alexander.....	Russia.....	re	128-64	gyrs	a	32	16	17	65																			
Wolf River.....	Wisconsin.....	rob	128-64	gyrs	sa	27	20	20	67																			
Buckingham.....	Virginia (?).....	obl	150-96	gyrs	sa	38	20	20	78																			
Yellow Bellflower.....	New Jersey.....	obl	140-64	pyb	sa	40	18	18	76																			
Grimes.....	West Virginia.....	rob	165-112	yb	rsa	47	24	22	93																			
Jonathan.....	New York.....	rob	225-96	yr	msa	48	20	22	90																			
Esopus.....	New York.....	rob	150-80	yr	sa	48	24	23	95																			
Delicious.....	Iowa.....	obl	140-72	rys	ma	45	17	20	82																			
Hubbardston.....	Massachusetts.....	obl	128-72	rys	sa	37	20	18	75																			
White Pearmain.....	(?).....	rob	175-112	pyb	psa	45	20	20	85																			
Melutosh.....	Ontario.....	rob	175-112	wrsc	sa	45	22	23	90																			
R. L. Greening.....	Rhode Island.....	rob	128-72	pyg	ba	38	17	20	75																			
Missouri.....	Missouri.....	rob	165-112	wrsc	bsa	30	18	23	71																			
Baldwin.....	Massachusetts.....	re	165-96	yr	sa	40	20	22	82																			
Hibernial.....	Russia.....	obl	128-96	rs	sa	30	20	15	65																			
Tompkins King.....	New York (?).....	obl	128-72	yr	sa	40	18	23	81																			
Shockey.....	Georgia.....	re	225-128	pyrb	sa	35	18	23	76																			
Terry.....	Georgia.....	re	250-128	yr	bsa	41	15	20	76																			
Wagner.....	New York.....	rob	165-96	yrsc	bsa	42	20	23	85																			
Rome Beauty.....	Ohio.....	rob	165-72	rys	psa	40	20	23	83																			
York Imperial.....	Pennsylvania.....	obl	165-112	wcs	sa	36	18	24	78																			
Arkansas.....	Arkansas.....	obl	165-72	yr	msa	40	17	20	77																			
Gano.....	(?).....	rob	140-80	dyr	sa	27	20	25	72																			
Ben Davis.....	(?).....	obl	110-96	rys	sa	25	20	23	68																			
Stayman Winesap.....	Kansas.....	obl	175-96	gyrs	rma	43	18	22	83																			
Winesap.....	New Jersey.....	rob	250-128	drs	msa	45	20	25	90																			
Northern Spy.....	New York.....	rob	110-80	gyrs	sa	46	22	22	90																			
Yellow Newtown.....	New York.....	rob	165-80	gy	ba	47	24	24	95																			

The following notes define the districts under the heading recommended for several districts from 1 to 18, at the right hand side of the table, entitled, "Suggestions to the Revision Committee of the American Pomological Society": District No. 1.—Maine, above 500 feet elevation; New Hampshire, Vermont and New York, north of latitude 44 degrees; Ontario, north of Lake Simcoe and east of longitude 80 degrees; Quebec, New Brunswick and Prince Edward Island. The dominant natural feature of this district is the St. Lawrence Valley. Many of the hardier fruits flourish within its borders.

District No. 2.—Nova Scotia; Maine, below 500 feet elevation; New Hampshire and Vermont, south of latitude 44 degrees; Massachusetts, Rhode Island, Connecticut; New York, south of latitude 44 degrees, except Long Island; Northern New Jersey, above 500 feet elevation; Pennsylvania, east of the Susquehanna River, and above 500 feet elevation north of latitude 41 degrees west to the Allegheny River, and all of that portion of the state lying north of the Ohio River; Ohio and Indiana, north of latitude 40 degrees; the lower peninsula of Michigan, and Ontario south of Lake Simcoe. The Annapolis Valley of Nova Scotia, the North Atlantic Coast, the lake region of Western New York, Ohio, Ontario and Michigan, and the Hudson River Valley are the leading features of district No. 2. This may be considered the Northern grape, peach and winter apple district.

District No. 3.—Long Island; New Jersey, except a small portion north; Eastern Pennsylvania, below 500 feet elevation; Delaware; and Maryland and Virginia below 500 feet elevation. This is the Delaware and Chesapeake Bay district. Though a small district its productive capacity of the fruits that succeed within its borders is great.

District No. 4.—Pennsylvania, above 500 feet elevation and south of latitude 41 degrees; Maryland, Virginia, North Carolina, South Carolina, Georgia, Mississippi and Alabama, above 500 feet elevation; West Virginia, Tennessee and Kentucky; Ohio and Indiana, south of latitude 40 degrees; Southern Illinois, below the general elevation of 500 feet, from the Wabash to the Mississippi; Missouri, south of a line from near St. Louis and along the elevation of 1,000 feet to the southeast corner of Kansas; Oklahoma, below 2,000 feet elevation, and Arkansas north of latitude 35 degrees, also south of it wherever the elevation exceeds 500 feet. The Allegheny and the Ozark Mountains and the valleys of the Ohio, the Tennessee and the Cumberland, and portions of the Wabash, the Mississippi and the Arkansas Rivers are embraced within this district. Portions of it are noted fruit regions, while throughout its vast territory the hardier deciduous



fruits flourish. Many of the varieties recommended succeed best in certain localities within the district. An exception to the general character of the district occurs in those portions of Kentucky, Tennessee, Arkansas and Southeastern Missouri lying near the Mississippi River, where the varieties adapted to culture in districts 5 and 7 generally succeed.

District No. 5.—Eastern North Carolina, South Carolina and Georgia, below 500 feet elevation, and Florida north of latitude 30 degrees east of the Chattahoochee River and above 100 feet elevation. This district embraces the Southern Atlantic seaboard with its frith-like indentations and valleys. The climate is generally mild, and within its borders many of the more tender deciduous fruits flourish.

District No. 6.—Florida, south of latitude 30 degrees; the remaining portions of the state with elevations below 100 feet, and those portions of Alabama, Mississippi, Louisiana, Arkansas and Texas lying below the 100-foot contour line as it skirts the coast from Florida to the Rio Grande. This is the Southern Peninsula and Gulf Coast district. The successful culture of citrus and other sub-tropical fruits and nuts is restricted to the peninsula portion of Florida and the Delta of the Mississippi. Tropical species are only recommended for that portion of Florida lying south of latitude 27 degrees, and are indicated by the letter S in connection with the starring.

District No. 7.—Florida, west of the Chattahoochee River and above 100 feet elevation; Alabama, Mississippi, Louisiana and Arkansas, above 100 and below 500 feet elevation, and Texas south of Red River and above 100 and below 1,000 feet elevation. This may be denominated the valley district. It embraces portions of the Chattahoochee, Alabama, Pearl, Mississippi, Arkansas, Red, Sabine, Colorado and Rio Grande Valleys. The climate in the eastern and larger portion is warm and moist, in the extreme west more dry and tending toward aridity. A wide range of the more tender varieties and species is adapted to culture in the district.

District No. 8.—Illinois, north of the 500-foot contour line as it crosses the state between 38 degrees and 39 degrees latitude; a very small portion of Southwest Wisconsin; Iowa, south of about latitude 42 degrees, thirty minutes; the Missouri River Valley portion of southeastern South Dakota; Nebraska and Kansas, below 2,000 feet elevation, and Missouri north of a line drawn from near St. Louis and along the elevation of 1,000 feet to the southeast corner of Kansas. The Missouri and Mississippi Valley sections of the district are its dominant feature. The hardy deciduous fruits succeed in most portions and commercial fruit growing is a rapidly developing industry.

District No. 9.—Wisconsin, except the small southwest corner; Minnesota, upper Michigan; Iowa, north of about latitude 42 degrees, 30 minutes; North

and South Dakota, east of longitude 99 degrees, and Canada west of longitude 80 degrees and east of longitude 99 degrees. This district embraces the upper lakes, including Winnipeg, the Upper Mississippi and the Red River Valleys. Only the hardier fruits succeed, but fair progress has been made in recent years in developing varieties adapted to this region.

District No. 10.—Nebraska, Kansas and Oklahoma above 2,000 feet, and Colorado below 5,000 feet elevation; also Texas above 1,000 feet and east of longitude 103 degrees and the Pecos River. This is the central plain and foothill district. It lies on the eastern slope of the Continental Divide. There are small sections, especially in Eastern Colorado and farther southward, where the apple and other hardy fruits are successfully grown.

District No. 11.—Texas west of longitude 103 degrees and the Pecos River, and New Mexico south of latitude 35 degrees. The Pecos and Rio Grande Valleys are the characteristic features of this district. Considerable effort at growing fruit, especially of apples and the hardier vinifera grapes, is being made in many localities.

District No. 12.—New Mexico and Arizona, north of latitude 35 degrees; Utah; and Colorado above 5,000 feet elevation. This district embraces the Continental Divide and the Great Salt Lake, and it also embraces the valley and canyon of the Colorado and the sources of the important streams south of the Missouri and Yellowstone. It affords a great diversity of soils and climatic conditions, and hence a wide range of fruit growing. The species successfully grown within the boundaries of this district range from the vinifera grapes to the hardy, ironclad apples.

District No. 13.—The Dakotas, west of longitude 99 degrees; Wyoming; Montana, east of longitude 111 degrees, and the British provinces lying between longitude 99 degrees and 111 degrees. The Upper Missouri and Yellowstone Valleys are the distinctive features of the district. There is perhaps no section of the district in which fruit growing has reached a very high state of development. Leading causes of this condition may be found in the comparatively undeveloped or unsettled state of the country and its great elevation.

District No. 14.—British America, west of longitude 111 degrees and east of longitude 122 degrees; Montana, west of longitude 111 degrees; Idaho, Nevada, Washington, Oregon, and California east of the general coast contour line of 1,000 feet elevation, commencing at the British boundaries near longitude 122 degrees and south on said elevation to its intersection with the Southern Pacific Railway in the Upper Willamette Valley, thence along the line of said railway to the Sacramento Valley, thence east and south on the eastern rim of said valley and that of the San Joaquin at an elevation of 1,000 feet to latitude 35 degrees, thence

east on said latitude to the Colorado River. The characteristic features of this district are the Upper Columbia Valley and the Sierra Nevada Mountains. An exception to the general recommendation will appear in certain portions of the Snake River Valley, where the vinifera grapes and other tender fruits succeed.

District No. 15.—The coast section of British America west of longitude 122 degrees, and of Washington, Oregon and California north of about latitude 39 degrees, 30 minutes, are bounded on the east by districts 15 and 17. This district embraces the highly developed fruit growing sections on Puget Sound and the Lower Columbia and the Willamette Rivers.

District No. 16.—The Sacramento and San Joaquin Valleys, bounded on the east by district No. 15 and on the west by the western rim of this great interior basin. The diversified fruit and nut products of this district are marvelous. There are localities in which the semi-tropical species and other places where the apple, pear and other hardy fruit and nuts are grown to the highest perfection.

District No. 17.—The coast section of California lying between latitude 35 degrees and about 39 degrees, 30 minutes, and bounded on the east by district No. 17. Its characteristic features are the coast range of mountains, the Russian River and the Sonoma, the Santa Clara and the Pajaro Valleys.

District No. 18.—California and Arizona, south of latitude 35 degrees. The dominant characteristics are the valleys of the Gila, the Colorado, the San Gabriel and the Santa Ana and the Sierra Madre Mountains. It includes the celebrated fruit districts of Santa Ana, Riverside, Santa Barbara, the Salt River Valley, San Diego, and many others.

Recent developments of the fruit industry in several isolated localities in district No. 14 have demonstrated the fact that many of the deciduous fruits can be grown with perfect success. This is especially the case in the Hood River and Rogue River Valleys in Oregon, in the Wenatchee and Yakima Valleys in Washington and in other favored sections. Districts 15, 16, 17 and 18 are peculiarly adapted to fruit and nut culture. Perhaps no portion of the earth's surface is more highly favored in climate and soil and affords a wider range of crop products than that lying within the boundaries of these four districts. The commercial value of the fruit and nut products of this section is recognized the world over.

## FARM JOURNAL

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263 NORTH CLIFTON ST.

PHILADELPHIA





English walnut tree, Dundee, Oregon, seven years old

## The Culture and Care of Bramble Fruits

By J. F. Littooy, Consulting Horticulturist, Mountain Home, Idaho

**A**S raspberry and blackberry culture is one of the leading industries in certain sections of the Northwest, it is the purpose of this treatise to assist the grower with information on the life habit of the plants, thus leading up to intelligent culture, not only in the Northwest, but elsewhere as well.

Many methods of culture are adopted by growers, and no treatise has as yet been given them to direct their attention to any one method for standard as well as intensive culture.

Some one system must be superior, and the object of this treatise is to introduce or lead up to one which may be accepted as such throughout the country. No attempt has as yet been made to classify the habits of growth of the bramble fruits, and it is the purpose of this treatise to discuss such in detail as it has a bearing of economic importance to intensive practice.

The method of culture for the bramble fruits has not had the attention due it, and up to the present time no one special system is recognized for its advantage.

Its commercial prominence as an industry should bring about a system of culture that may be accepted from a practical and scientific standpoint as standard.

At present there are almost as many systems with its modifications as there are growers, and to agree on some one system appears a difficult question.

The fact that so many systems exist is evidence that some one system should be superior.

A review of some of the many systems of culture may be interesting and assist us to divert our thought for investigation.

1. The current year's canes are allowed to grow full length, none being cut back.

2. Same as above, but cutting part away during fall or spring.

3. Same as the above two systems, but suckering or cutting away the surplus growth of canes.

4. Same as 1 and 2, but confining all new canes to the original stool.

5. Same as 1 and 2, but growing them in rows.

6. Planted an equal distance apart for cultivation both ways.

7. The row or hill system and cutting back the current year's growth when at a desired height to produce laterals, which are cut back or not at option of owner, fall or spring.

8. Same as No. 7, but cutting the laterals back the second time during the current year's growth to produce sub-laterals, endeavoring to make the plant stocky, and thus using no supports.

9. Cutting the tops back heavily in spring, thus endeavoring to use no supports.

10. The matted row system, allowing all the canes to grow at will in a continuous row but restricting its width.

11. Same as No. 10, but thinning the canes in the row.

12. The various espalier systems or combinations of any of the above, etc.

Various methods are used for the support of the canes.

(A) Stakes are driven in each hill, to which the fruiting canes are fastened.

(B) Posts are set at a certain distance, a foot from each side of the row, to which wire or strips of wood are secured at a certain height, thus keeping the canes from falling between the rows.

(C) Supports for the espalier or other systems.

To entertain an intelligent conclusion as to which system shall be nature's choice, to assist us for best results, we must learn her ways.

Nature has but one successful way of bringing each species of plant life to its perfection, and it is obvious that we secure her assistance for an investigation to lead to intelligent results.

Assisting and not resisting nature must be our aim if success is to crown our efforts.



The life habit of the plant is biennial with a perennial root.

The canes of the current year's growth bear fruit the following season and die after fruiting, while the root lives indefinitely.

The habits of growth varies according to the variety. Some are erect growers (as the Antwerp), some semi-vinous (as the black raspberry and the Cuthbert), some vinous (as the Logan). The erect varieties do not grow laterals. The semi-vinous, during their new growth, will bend from their own weight, checking the free flow of sap at the bend, thus making active the dormant buds at this point, forcing them to produce laterals to relieve the pent-up pressure.

The canes of the vinous, not naturally rigid, do not grow erect, but force their quick growth to trail over anything in its way and results in no check of the flow of sap to produce laterals, unless done by excessive vigor.

Any condition which causes a sudden excessive growth during the growing season may cause the canes of any variety to produce laterals, especially if they are growing on much incline or pruned.

Winds also exert an influence toward checking the free flow of sap and cause dormant buds to produce laterals.

These are all secondary causes, influenced by nature, to produce laterals, but such results are not congenial for the plant's best success.

The more erect the canes grow, with no secondary causes influencing them to grow on an incline during the current year's growth, the less chance there will be for the canes to produce laterals.

Understanding the natural habit of the plant, it will be seen that any of the cane fruits bear fruit without producing laterals and that it is unnatural for them to do so in their ideal conditions, and since they produce larger fruit without laterals it is evident that to secure the best results that the most natural and ideal conditions should be considered and lateral growth should be avoided.

It is claimed that by cutting the canes back to produce laterals more berries are secured.

The smaller the lateral the smaller the fruit, and the more laterals the more fruit, but the fruit being smaller, the quantity is no more and the quality less.

The flow of sap is diverted into as many channels as there are laterals, and being thus divided the flow of sap is less in any one lateral than it would be if all the channels were combined in one; therefore the leaves on the laterals are small. The leaves are also shaded in proportion to the number of laterals produced, thus weakening their function.

The smaller the leaf the smaller will be the bud at its axil or base, which the leaf nourishes, and in which bud is formed the fruit nucleus for next season's crop. Large leaves can only be secured on canes exposed to sun and without laterals. Upon the size and vigor of the leaf depends the size and vigor of the bud, and upon this the size and vigor of the fruit spur and fruit.

If the laterals are cut back during the current year's growth to produce sub-laterals it is evident that the leaves would be very small.

This system is practiced principally in portions of the Eastern States, and if it had any good points in its favor it would be practical elsewhere.

Layering of canes as practiced in the East should be practiced with a tender variety, and layering, i. e. (covering with earth in winter), to protect the vines from the effects of freezing and thawing, such a bush on a rigid stem would be hard to bend or cover without injuring it, and the laterals, if bent, would break the tissue and weaken the canes and lessen the crop, and such wounds would be exposed to disease.

Layering the hardy varieties is practiced by some, but I believe it unnecessary if precautions have been used to mature the ripening of the tissue, and there is a possibility that this may apply to some of the less hardy varieties.

The system of producing laterals is a hindrance to quality, as too many leaves are produced, conflicting with each other, thus curtailing the light and interfering with the proper function of the leaves on the fruit spurs; and if these spur leaves cannot get light then the nourishment stored up in the cane the previous season will be lost to their use, and hence wasted proportionately, which is an expensive sacrifice when growing fruit for profit.

The fruit shaded by too many leaves must necessarily be soft for shipping, as only leaves in the sun can furnish the fruit the elaborated sap needed to harden its tissue, and if the fruit is not exposed to the free air and light then transpiration of excessive moisture of the cells is curtailed, and this also renders the fruit too soft for shipping.

Producing laterals where the soil is rich, especially if the plants are close,



Vineyard in the Willamette Valley





Oregon irrigated lands north of Redmond, on the Oregon Trunk Railway

is a hindrance to cultivation, as the canes become top heavy, and being uncontrollable bend or fall between the rows and are injured by cultivation and pickers, and the maturity of the cane retarded, as explained later.

If the soil is poor and the berries are produced on laterals the fruit would be very inferior in size and quality.

Canes without laterals and intelligently managed are more easily controlled, are larger and the leaves larger, producing large buds, hence large fruit. The system which will best produce these results must be desired.

The natural habit of the red raspberry is to produce numerous canes, the quantity depending upon the variety, vigor and management.

The leader canes are produced immediately at the base and on the fruiting canes and not, as some think, shooting up from the crown of the root.

Each cane usually produces two large developed buds at its base, which remain dormant until spring, when they become active and make new canes.

It is evident that in a few years they will be too numerous and result in diverting the flow of sap into too many channels, with results as already explained above as in the case of too many laterals.

New canes of the red raspberry are not only produced on the leader canes in the original stool, but also by suckers produced by the rhizomes or lateral roots.

It is evident that if large canes are to be procured that all the energy must be concentrated upon a few canes and to those in the original stools if strong hills are to be maintained, and a system of roots as well as of canes established to avoid the confusion of too many roots and canes.

If the roots are disturbed by deep plowing and cultivating in spring the suckers are more numerous, caused by the dormant buds on the rhizomes or roots being excited to activity, and this adds to the confusion of canes, and would ultimately mat between the rows

unless constant shallow cultivation is given to kill them.

Some growers prune back the canes or laterals severely. As each bud on the portion cut off would produce fruit this is wasteful practice. If canes or laterals are pruned much below the central portion the buds remaining will give little or no fruit. The base buds on all sprouts are weak, since the first leaves of plant life which formed them was small, and such buds are wood buds or semi-wood buds, according to the position they occupied when they were developed; hence they were too young to produce reproductive organs and could not well develop fruit buds.

Many plant the hills too close together in the row system, and results in the evil effects as already outlined.

Some use what is called the matted row system, the canes growing close together in a continuous row and the row restricted by cultivation to a certain width.

The result is that, the hills being close together, the roots are interlocked, girdling each other, impeding circulation of sap and each root is struggling against each other for the limited food supply. The canes being close together leaf action is also impeded, with results as previously mentioned.

The hill culture practiced by some provides for cultivating both ways. The fruiting canes are bunched together and secured to a stake in the center of hill. This deprives the larger portion of the buds of light and the buds which are exposed develop into fruit spurs first by having the advantage of those not exposed to light, and weakening them all the more. The weak buds which may develop into spurs are greatly impeded in their endeavor to secure light.

If laterals are produced in hill culture the difficulty is much enhanced.

Some of the weak spurs will struggle through a winding course to secure light, and the bend occasioned checks the flow of sap in the spur as well as

shading its leaves, and hence the fruit on such spurs will be small.

This system provides no method of control for the new canes; as a result they are forced to the ground by many causes and injured.

The hill system is being discarded by many and the row culture substituted, which provides for wires three feet high on each side of the row, supported by posts a rod apart, thus in a measure controlling the canes in hills set three feet apart in the row and all suckers or surplus canes cut out.

This system almost approaches the natural method of controlling the canes and will answer in controlling the new growth of the erect varieties, but for the semi-vinous it is much in error, since by its natural habit it grows on an incline through being top heavy if the growth is at all vigorous.

This plan affords such new growing canes of the semi-vinous little chance to ripen and harden their tissue, as the flow of sap being checked by the bend of the incline, the cells at the bend are constantly irritated by the top-heavy weight of the cane and its movements by wind that a strain occurs, thus exciting new growth because the balance is broken between root and top and the dormant buds at the bend (or below point of the strain) become excited into new shoots or laterals to receive the extra vigor of the cane, and the result is a continual succulent growth of such laterals which cannot properly ripen, and therefore not prepared to resist the attacks of severe winter or disease.

It is not uncommon to see the leaves of such laterals late in the fall or early winter.

The soil conditions conducive to a vigorous growth, and especially with a variety of berry naturally a vigorous grower, compels an abnormal growth, and such is naturally conducive to weakness. Under such conditions a variety like the Cuthbert will make a growth by the latter part of June that under normal conditions would be sufficient for the season. The Cuthbert, having the semi-vinous habit, especially



when growing under such abnormal conditions, will begin to bend (because being top heavy) early in the summer and, as described above, it results in producing activity to the dormant buds below the point of strain and causing them to produce very vigorously growing laterals. These laterals now have the advantage of upright position and the advantage of being nearer the root than the main cane above the laterals, and as a result these laterals act as suckers to the original main cane above them, and therefore this part of the main cane is kept in an immature condition and will freeze during a severe winter at a point above the laterals, as this point will be lacking in elaborated sap to resist frost. This condition is oftentimes mistaken for disease.

Throughout the Eastern States it frequently happens that the second growth of suckers are the ones to withstand the rigors of winter because they have better elaborated sap than the first growth of canes, which latter frequently takes on the second growth after a dry season, and stimulated by the early fall rains goes into winter quarters in an immature condition. Especially would this apply to the varieties that sucker readily like the Cuthbert. Then, also, the second growth suckers will be largely protected by the deep snows.

There is no doubt that the above explanation accounts for many hardy varieties being classed as tender and many tender varieties discarded which could have been in general use today to supply us with a higher quality of this fruit.

To secure full ripening of the canes of the current year's growth it is important that every leaf on the cane have full access to sun and air, and every cane securely controlled to a fixed position to grow erect, thus focusing all surplus and succulent growth at the terminal point, its natural place, and hastening the growth and maturity of the cane.

It is very important that the young canes be matured during the maturing season, for if they do not ripen by late summer the rains and cool fall weather will stimulate them to growing with more vigor.

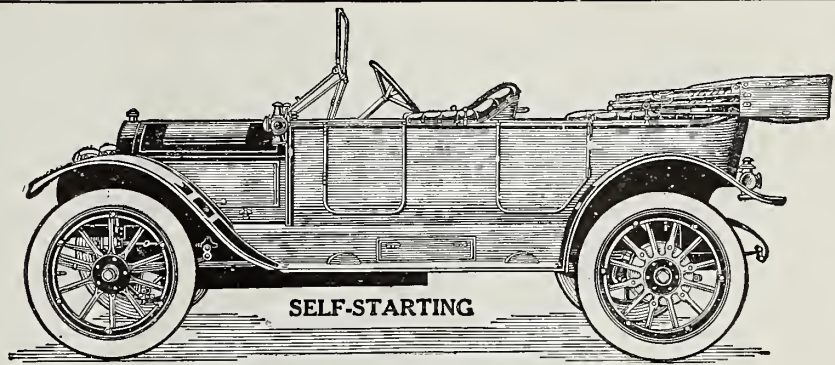
The early growth should be given every opportunity and advantage to grow rapidly by suckering, cultivating, manuring, moisture conditions and exposure to sun.

To obtain this it is important not to have too many canes in a hill, or hills close together.

If such care is given and the canes matured should be influenced by secondary causes at times and excited to growth, it will only be at the extreme terminal bud and can result in no damage, since this second growth can never be excessive, as the many buds about the terminal are close together and are matured fruit cells, and hence has very little surplus wood tissue for new growth, and if formed could be cut off if necessary with no evil effects.

Some practice twisting canes to wire or trellis near the ground, as they claim this makes picking of fruit easy. This is bad practice and makes fruit harder to pick. It interferes with the free circulation of sap, making fruit smaller, and exposes to disease any abrasions caused by twisting and forces too much vigor to the new shoots at base of cane, which may not be desirable if the hill is already too vigorous.

Continued on page 49



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**The Sulzer Bill.**—The hearing on the Sulzer bill (H. R. 17936) to establish standard grades and packages was held before the house committee on coinage, weights and measures March 7 and 8. The "Spy" states that the hearing was remarkable for three things: "First, the extent of the territory represented; second, the unanimity of endorsement shown; third, the coming together of the East and West in peace in co-operation." There were many prominent men from all parts of United States representing the fruit industry. The following in particular are mentioned by the "Spy": "Judge Fremont Wood of Boise, Idaho, president of the Idaho State Horticultural Society, a large grower of apples and the presiding judge at the celebrated Moyer-Haywood trials of a few years ago; C. E. Whistler of Medford, Oregon, one of the big men of the Northwest and general representative of those states; W. K. Newell of Gaston, Oregon, president of the Oregon State Board of Horticulture, whom to meet is one of the real pleasures of life. From the barreled apple sections there were Hon. S. L. Lupton of Winchester, Virginia, representing the Eastern Fruit Growers' Association, comprising the states adjacent to Virginia, with a membership of between five and six thousand; W. A. McComb of Staunton, Virginia, representing the Virginia Horticultural Society, membership twelve hundred; D. N. Minick

of Chambersburg, Pennsylvania, of the Adams County Fruit Growers' Association of Pennsylvania; E. B. Norris of Sodus, New York, representing the New York State Fruit Growers' Association, membership twelve hundred; Samuel Fraser of Geneseo, New York, representing the Western New York Horticultural Society, membership sixteen hundred, and also the Rochester Chamber of Commerce; R. H. Pennington of Evansville, Indiana, president of the Western Fruit Jobbers' Association; R. S. French, business manager of the National League of Commission Merchants; E. N. Loomis of New York City, president of the International Apple Shippers' Association; W. L. Wagner of Chicago, Illinois, special representative of the Western Fruit Jobbers; C. B. Shafer of Gasport, New York, chairman of the Conference Committee; U. G. Border of Baltimore, Maryland, special representative from the commercial bodies of Baltimore; Allen Bond of Winchester, Virginia, representing the Frederick County Horticultural Society; L. A. Fisher of the Bureau of Standards, Washington, D. C."

On the sixth of March, by unanimous action of the conference committee, the bill was redrafted by a special committee composed of S. L. Lupton, Edward N. Loomis, W. L. Wagner, R. S. French and R. G. Phillips, with Judge Wood as counsel. The box and basket were omitted entirely from the measure and the bill made to apply solely to the barrel and the grades for barreled apples. This action not only met with the approval of the Northwestern representatives, but all of them appeared before the committee, together with Congressman Hawley of Oregon, and gave the bill their hearty support. They believe in its principles and the object in view, and before long the box section will no doubt make application for standardization in accordance with their special needs, and after they have had opportunity to get together throughout that territory and agree upon what they want. It was recognized by all parties, especially in view of the development of the last two years, that the box and barrel sections were two entirely different propositions and that the wishes of the Northwest to decide first for themselves should be respected.

The original bill for standardization and grading of apples was the Porter bill which was killed. This was followed by the Lafean bill, which went by the wayside, and the Sulzer bill is the outcome of a great many conferences, discussions and arrangements. That the East and West did not get together earlier was probably due to the fact that the East did not fully understand what the size of the box meant to the West in the matter of uniformity of pack. This was evidenced very forcibly at some of the previous meetings when a strong advocate of the Lafean bill attempted to pack a box but was absolutely unable to do so. This in itself indicated that many who advocated the Lafean bill

really knew nothing about packing a box of apples, and therefore were unable to understand the requirements of the Western box trade. The apple growers of the Northwest never have been opposed to standardization or grades, but are earnestly in favor of them. What we have claimed has been that the East should not dictate what size box we should use or determine without consulting us what grades we should make, but that is all past and gone, and therefore should be forgotten. "Better Fruit," up to the present time, has stood practically on these grounds editorially, and in doing so believe that we have voiced the opinion of practically every fruitgrower of the entire Northwest. It affords us great pleasure to have the East, the dealers and growers and the fruit trade in general, answer frankly, as they have done, viz: "That the box and barrel sections are entirely two different propositions and the wishes of the Northwest to decide first for themselves should be respected." Thus the West and East have come together, not to oppose but to co-operate for the common good. We believe that great results will follow from this meeting, and the better understanding and friendships there cemented. We are convinced of their sincerity and we believe they are convinced of ours. Let us move together.

**The Middleman.**—President E. N. Loomis in an article in the "Spy" states: "The modern doctrine of the evil of the middleman is fast evaporating. The problem of the grower is how to change his fruit into the utmost possible money. Either the middleman is of assistance in that problem, and furnishes a real service in bringing the fruit to the ultimate consumer whose money rewards the grower, or else he is a stumbling block and an obstacle to the farmer. If the grower has the latter opinion let us retire gracefully to other pleasures or pursuits until the grower seeks our aid. If the grower does not appreciate the importance of the middleman in the scheme of distributing and marketing the crop, then it follows with equal certainty that the middleman must be rewarded for his service as well as the grower rewarded for growing fruit. This conclusion will help a long way toward making investments in future of some value." All of this is very wisely and well expressed, but it is not our understanding that the middleman is considered an evil by the Northwestern fruitgrowers. On the other hand, they realize his importance and his value as a distributing medium. In the East, however, conditions may be different, and the feeling against the middleman, antagonism on the part of the fruitgrower, may be, as might be inferred from the statement of Mr. Loomis. The legitimate middleman is certainly entitled to a fair profit for his work and capital invested, and generally speaking the profit of wise middlemen such as members of the International Shippers' Association, the National League of Commissionmen



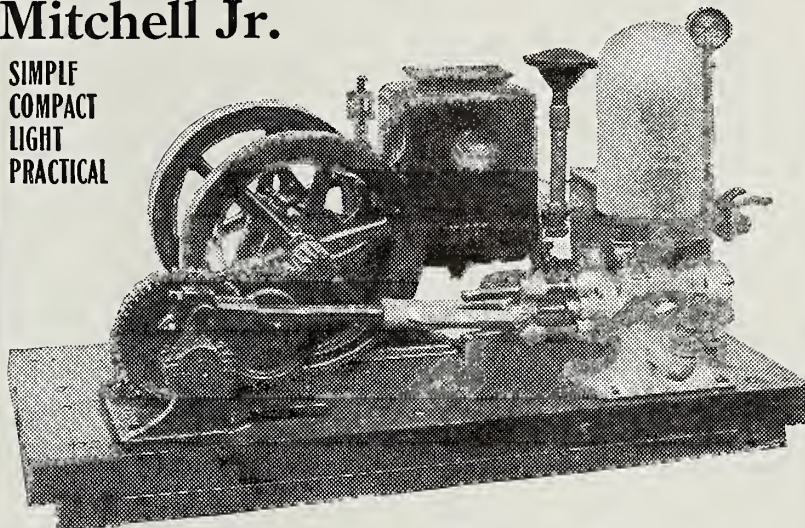
and the Western Jobbers do not generally seem to be unreasonable, but after the fruit and produce leaves the hands of the original purchaser, or commissionman, there seems to be an immense amount of money expended in handling it or some very large profits taken to account for the difference between the price obtained by the fruitgrower and the price paid by the consumer. A short time ago, in one of the popular monthlies, an article appeared commenting on the number of grocery stores in New York City. In speaking of the number the writer of the article drew the conclusions that the grocery business in New York City could be done by a greatly reduced number of grocery stores and much less expense. Mr. G. T. Powell, who delivered an address before the Grange of New York City, which was published in the National League Bulletin, made the statement that potatoes which the New York people consumed cost them \$60,000,000, for which the producer received \$8,000,000. Now we don't assume that the fruit and produce dealers who first handled these potatoes receive all this money, but it cannot but be admitted that the distribution must be very expensive, the profit taking firms either very numerous or the profits somewhat large. That is to say, the distribution must have been unnecessarily expensive in some manner or other. A prominent citizen of Portland, Oregon, who was interested in the dairying business, gave considerable thought to the matter of distribution of milk and the expense. The lesson drawn was very clear and illustrated the enormous expense in the delivery to consumer. He found that a large number of dairies were supplying Portland, a city of about 250,000, and that each one had a number of delivery routes running all over the city. In fact a large number of the dairies were delivering milk in some territories which meant a very heavy extra expense. As the story was told, the investigator, after ascertaining the cause of the high cost of milk, was able in this instance to suggest a remedy which would not only deliver the milk at the consumer's door at less cost but with better profit to the dairyman. The suggestion was that the dairies co-operate in some system of districting the city so that each one would take a certain route or certain amount of territory, and that the city be divided up in this way. It must be admitted that some such system would assure an immense saving in that particular line of business, and perhaps if sufficient thought and study were given the subject of distribution and sale of fruits the unnecessarily large leaks could be eliminated and the cost of distribution reduced. Fruit would be supplied to the consumer at less price, the grower would receive a better profit and the cheaper price create a greater consumption.

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At no time during the history of the fruit industry of the Northwest have the subjects of associations, the marketing problem and the central selling agency been given more consideration than during the past winter. These discussions have been of immense value and highly educational in every way. Nearly every fruitgrower has some information and some knowledge about marketing problems, selling agencies, etc., whereas a few years ago this knowledge was limited to comparatively few. It is the general impression, without any question, that the fruitgrowers of the Northwest are getting a better understanding of these problems and are progressing toward the solution which will improve conditions. Some big jobs have been accomplished in a very short space of time. The world was made in six days, but the problem of selling and distributing fruit has been and is yet in the stage of evolution. The beginning of progress in the marketing problem commenced with the organization of the first associations, and much improvement has been made. It must be admitted that at no time is everybody satisfied, and it is quite true that it is doubtful if the time will ever come when

everybody will be satisfied. The lesson the fruitgrowers of the Northwest have taken so many years to learn is that growing and selling fruit are two different lines of business, and that selling fruit must be done by men who are not only business men but men of good judgment, with a knowledge of the fruit business, and a knowledge of salesmanship which can only be obtained through experience.

### The Vesuvius Plum

The Vesuvius Plum tree is worthy of its name, for its color is so surpassingly beautiful that while it excites admiration at a distance closer examination only intensifies the first expression of delight which its beautiful foliage is sure to arouse. (See cover illustration, this issue.) It is somewhat like *Prunus pissardi*, the old Purple-Leaved Plum, but so superior that the old purple-leaved plum will become obsolete. Its fruit is of a deep rich color, possessed of a pleasant acid flavor. It is not a very prolific bearer, hence we recommend it only as a striking foliage tree worthy of a place in every garden and park. We give Mr. Burbank's description, and do not believe that we can



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add anything further except to say that we endorse all his statements excepting that he does not do full justice to this most beautiful foliage tree: "The *Prunus pissardi*, a crimson-leaved form of the *Prunus myrobalana* introduced twenty years ago, is the only good purple-leaved plum generally known. For the past eighteen years have been raising hybrids of this and American and Japan plums, hundreds of which

are superior to the original well known *pissardi* in all respects; but among all known crimson-leaved trees of any kind *Vesuvius* stands alone. The trees are tremendous growers, taking on a peculiarly picturesque appearance; branches deep purplish crimson, leaves gigantic (often four and one-half inches wide by six long), but, above all, these great leaves are of the most beautiful metallic crimson color

throughout, both on the upper and under surface, having a crumpled surface very much like a *Coleus*. Nothing in this line can compare with *Vesuvius* in color. Tree a very strong grower, taking the graceful form of the American elm. Fruit nearly globular, three and one-half inches around, fair quality, especially for cooking, but not an abundant producer of fruit. Any tree which produces such beautiful foliage should not be expected to produce much fruit. The growth and foliage of *Vesuvius* will make it the coming tree for foliage effect, beautiful in the distance, but more so on closer inspection." Nothing we can say so forcibly illustrates the gorgeous coloring of this new purple-leaved variety as the fine illustration we show of it on the front cover page. Allowing for the fact that in this picture the leaves are less than one-half their natural size, its transcendent beauty is obvious. Indeed, there is scarcely a single deciduous tree which for gorgeous coloring lends so striking a beauty to the lawn, conservatory or fruit garden. In planting and treatment follow the usual routine with other varieties of plums, only in pruning be careful after the head is once established to prune to an upper bud, as this tends to bring out the beautiful weeping effect.—From "New Products of the Trees," issued by The Fancher Creek Nurseries.

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## Kelso Forms Union

The fruit growers of Kelso last Friday formed a selling union very similar to that of the Hood River Union, although the district as yet is producing only a small quantity of commercial fruit. H. C. Ritz, of "Better Fruit," was present for the meeting and delivered an address on the most successful methods for unions to follow. The Kelso growers for the most part are owners of tracts devoted to the growing of agricultural products and dairying. However, each year they are devoting more and more land to fruit. The product has already reached the point where the home demand is supplied, and the union was formed to find foreign markets.—Exchange.



# My Ideal of a Car

By R. E. Olds, Designer

Reo the Fifth—My Farewell Car—in every detail marks the best I know. And I've built cars for 25 years. If any man can build a car better he's a better man than I.

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Automobile makers say it is simply impossible to give the best in a car for \$1,055.

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This price, I believe, can not be continued. Our contracts with dealers provide for advance.

But I promise you this:

Reo the Fifth, while I direct the making, will embody the best of which I am capable, regardless of price or profit.

## Men Look to Me

Tens of thousands of men, in the past quarter century, have used cars of my designing.

They have come to have faith in me. They believe that I know.

Reo the Fifth is my finest car, the cap-sheaf of my career. And myriads of men will remember me by it, whatever new cars the Reo plant may bring out.

You who look to me can rest assured that this car marks my limit.

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I have spent 18 months in designing this Farewell Car.

I searched the whole motor car world for ideas for it. In it I embodied the best I had learned from the 23 models which I built before it.

I never before gave such care to a car. Nor has any other man, I think.

Never have I stood for such big margins of safety—never insisted on such careful inspection.

Never before have I gone so far to get the final touch.

## Look for Yourself

The lines of the car show its up-to-dateness.

The body is finished with 17 coats. The lamps are enameled. Even under the hood you'll find the engine nickel trimmed.

Note the deep upholstering, made of genuine leather, filled with genuine hair.

Note the car's roominess. Note the big wheels. The car is over-tired.

Note the absence of petty economies.

## The Parts Which Tell

But the parts which tell in the long run are the hidden parts of a car. Men's final judgment will depend on them.

I use Nickel Steel in the axles and driving shaft, and I make them much larger than necessary. I use Vanadium steel for connections.

Each lot of steel, to make sure of it, is analyzed before I use it.

The gears are tested in a crushing machine of 50 tons' capacity.

The magneto is tested under conditions which very few can stand.

The carburetor is doubly heated, to avoid the troubles due to low-grade gasoline.

Roller bearings are used—Timken and Hyatt—where ball bearings once sufficed. There are only three ball bearings in this whole car, and two are in the fan.

So in every part. All the precautions taught me by experience are employed in this Reo the Fifth.

## New Center Control No Side Levers

Then here, for the first time, is a cane-handle control. All the gear shifting is done by slightly moving this lever in each of four directions.

Both brakes are operated by foot pedals, and one pedal also operates the clutch.

So there are no side levers—there is nothing in the way of the front doors.

This arrangement permits the left side drive, heretofore possible in electric cars only. The driver sits as he should sit, close to the cars he passes and on the up side of the road.

These are conveniences found today in Reo the Fifth alone.

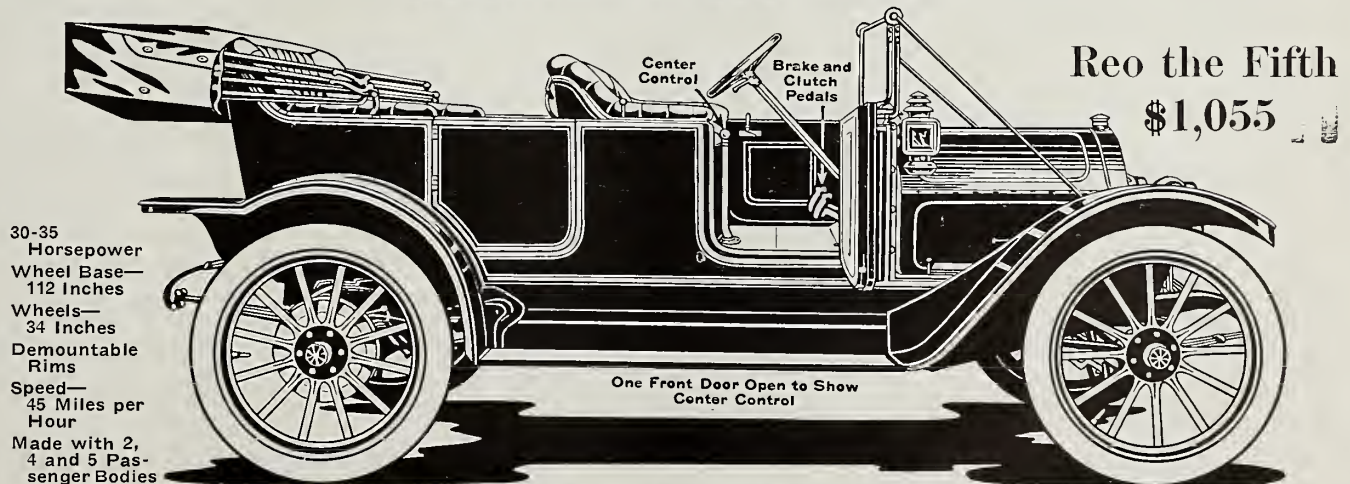
## Ask for the Book

Our Book points out all the perfections, and pictures the various bodies. Every motor car lover should have it, for this is one of the interesting cars.

Write us to mail it—write us now—and we will also tell you where the car can be seen. Address

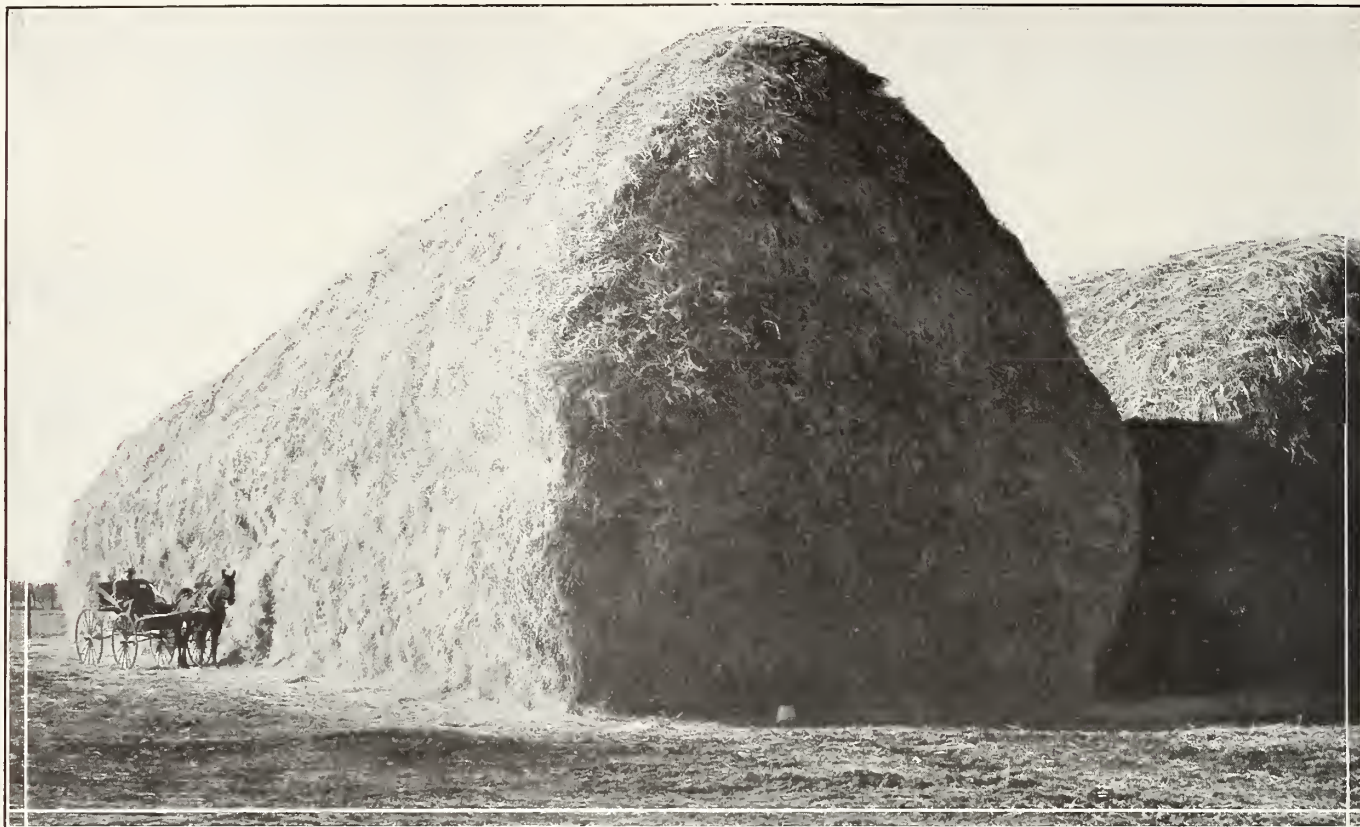
**R. M. Owen & Co.,** General Sales Agents for **Reo Motor Car Co., Lansing, Mich.**

CANADIAN FACTORY, ST. CATHARINES, ONTARIO



Top and windshield not included in price. We equip this car with mohair top, side curtains and slip-cover, windshield, gas tank and speedometer—all for \$100 extra. SELF-STARTER, IF WANTED, \$20 EXTRA





Sample Oregon alfalfa stacks

## President Sawyer Picks Assistants

From Yakima (Washington) Herald, February 15, 1912

W. P. Sawyer, president of the Washington State Horticultural Association, who was in North Yakima Wednesday, spoke most hopefully of the prospects of the association, particularly with reference to the work which it is expected will be accomplished the coming year. He is also hopeful that the annual gathering in North Yakima in 1913 will be the best in the history of the organization and will result in much valuable information for the fruit culturists of this valley and state. Mr. Sawyer has recently been at Walla Walla in attendance on a meeting which is making preparations for the work of the coming season, and has appointed his committees, which are expected to get busy now and do what they can toward pushing the cause. Those committees are as follows:

**Legislation**—E. F. Benson, Tacoma, chairman; E. C. Burlingame, Walla Walla; H. M. Gilbert, Toppenish; M. N. Richards, North Yakima, and M. Horan, Wenatchee.

**Transportation and Markets**—H. M. Gilbert, Toppenish, chairman; W. T. Clark, Wenatchee; M. E. Olsen, Toppenish; L. H. Tichenal, Cashmere, and W. S. Offner, Walla Walla.

**Fairs and Exhibits**—E. Remy, North Yakima, chairman; J. L. Smith, Spokane; C. L. Whitney, Walla Walla; George E. C. Johnson, North Yakima, and W. W. Butler, Grandview.

**State Fair Committee**—S. M. McKee, Selah, chairman; R. A. Jones, Spokane;

E. Remy, North Yakima; A. W. Ritz, Walla Walla, and W. L. Wright, North Yakima.

**Membership**—L. H. Tichenal, Cashmere, chairman; R. A. Jones, Spokane; C. L. Whitney, Walla Walla; E. Remy, North Yakima, and George M. Chase, Prosser.

"This one thing is certain," said Mr. Sawyer, "and that is that we have a fine organization despite the fact that we have made no especial attempt to make the most of it. Unquestionably the time is now here to so build it up that in every way it will cover the field, and I have no doubt that we will achieve that end."

After the lapse of three or four years, unless peach trees have been carefully pruned every year, they are generally of a straggling appearance, without bearing wood only at the extreme ends. This is not desirable, and with proper management need not be. However, when trees are in this condition they can be made as good as new by a good pruning when they are dormant, say toward the approach of spring. Saw them back to near the lower ends of the branches, when new shoots will follow, resulting in trees full of vigorous young shoots. When the cutting back of all that appear to require it would result in the loss of a crop the season approaching there may be a compromise in pruning. Instead of cutting back all the limbs take the worst

only, letting the rest go until the year following. The appearance of the tree would not be as good as it would were all the limbs cut back at the same time, still the getting of fruit is of more consequence than the appearance, oftentimes. To prevent trees getting "long-legged," as gardeners call it, is easy. In summer, when the growth of shoots is being made, go over the trees, nipping off the ends of those that seem growing out of line. A pinching back of the shoots that need it causes the side buds to break, the tree thus making a symmetrical tree and one from which the fruit is easily gathered. It is shaped in this way easier and quicker than when growth is let form as it will, trusting to the knife to set matters right later; and this applies to all trees as well as to peaches.—Practical Farmer.

The highest types of apple in the world today are the Hood River Spitzenberg and Yellow Newtown Pippin; the highest type today to Hood River's cosmopolitan people of a life insurance policy is a Policy of the National Life Insurance Company of the United States of America, of Chicago.

These Policies, which hundreds of your neighbors have, make superb Christmas presents, Happy New Year gifts, appropriate wedding presents, choice birthday reminders and unexcelled anniversary tokens.

Write for information to the Agent at Large, Dr. James H. Shults, Hood River, whom most of you know, quote "Better Fruit," and full and satisfactory information will be furnished and hurry orders will receive prompt attention by telegraph and special delivery letters.



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has solved your neighbor's  
spraying problems

## It Will Solve Yours

Our 64 page catalogue shows you how  
Let us send it to you

### THE HARDIE MANUFACTURING CO.

49 North Front Street, Portland, Oregon

Hudson, Michigan

## WE LEARNED HOW TO BUILD SPRAY PUMPS BY USING THEM

For years we have experimented with our own machines in real orchards, to see just how they work. We watch to see how they wear, how different solutions affect them, what pressure they raise, and so on. Whenever we see a chance for improvement, we add it and *try it out*.

OF COURSE YOU WANT A

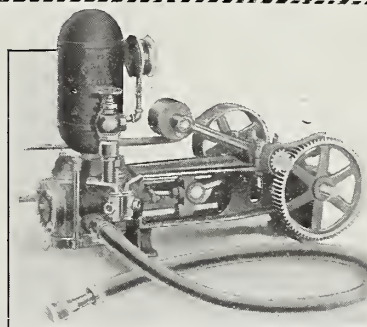
### Deming Spray Pump

We make over 20 styles; gasoline engine machines, traction pumps and big hand pumps, knapsack and bucket outfits—all one high grade of workmanship, with working parts of brass.

ASK FOR CATALOG AND NAME OF DEMING DEALER NEAR YOU

Deming Spray Pumps are sold by hardware and implement dealers almost everywhere. Consult *your* dealer; insist upon getting DEMING Sprayers. If he refuses, write us.

THE DEMING COMPANY, 335 Success Building, Salem, Ohio  
CRANE CO., Pacific Coast Agents,  
Portland, Seattle, Spokane, San Francisco



## American Apples in Southern England

Consul Albert W. Swalm, Southampton, in Daily Consular and Trade Reports

IMPORTS of apples in cases at Southampton have greatly increased in the past two years, a growth to which the orchardists of the State of Washington have largely contributed. Oregon wrapped and selected case apples have been on the English market for years and have won an enviable place. The Washington fruit has closed its third season, with the quality all that could be desired and the packing excellent. The financial results of the second year of this fruit in the Southampton market led a number of Washington growers to do their own shipping and consigning with a view to direct trading. The demoralizing effect of these indiscriminate shipments can best be shown by concrete examples. The season's first consignment of choice Washington Jonathans sold quickly at \$3 per case at quaside, with a demand booked that would have taken the entire Jonathan crop from that state; but between the arrival at Southampton of the first and second consignments one of 3,000 cases of extra fancy Jonathans was sent to Covent Gardens, in London, and sold at auction at \$1.50 to \$2 per case, thus naturally demoralizing the local market. The result was that instead of a well regulated sale of that apple at good prices throughout the season the early buyers found themselves in competition with dealers whose fruit had

cost them much less. A consignment of Spitzenbergs netted its Washington grower \$2.75; soon afterward the same variety was auctioned off at Covent Garden at \$2 per case, netting the grower of that shipment about one dollar. Another species was sold at Southampton at \$1.80 net, but Covent Garden auctioned a consignment of the same kind of apples at \$1.50 and less, freight and commission to be deducted. A somewhat different result was obtained by the Washington apple known in Southampton as the "Winter Banana." Control of this variety fell into the hands of one man, who judiciously fed the consignment to the market at constantly advancing prices, the actual sales in lots being at \$4 to \$6 net to the producer. England's purchases of apples from the West are of vast importance to the American orchardist. If the grower is rightly advised and follows a good business policy he can be sure of profitable returns in the Southampton market, but he must keep control of his shipments, never allowing the Covent Garden auction to make him a victim. The producer has an unquestioned right to protect himself in the line of fair profit. To secure this protection he must regulate his shipments to avoid glutting an otherwise profitable market.

## Woolly Aphis

Professor A. L. Melander, entomologist at the State Agricultural Experiment Station at Pullman, Washington, has prepared the following statement and recommendations for combating this insect in the orchards of this state. The woolly aphis is one of the most serious of orchard pests. It occurs both on the roots and on the branches of apple trees. The form above ground can easily be killed by spraying. A spray of tobacco, such as the black leaf dip, one part to sixty-five parts of water, or kerosene emulsion, or even a combination spray containing these two mixed, will easily kill the aphis on the branches. To make sure of thorough work the spray should be applied with bordeaux nozzles and driven with considerable pressure. It is necessary to wet through the wool of the insects. If the spraying can be thorough the ordinary sulphur lime spray will destroy the aphis above ground. For the root form there is no satisfactory treatment. Placing ground tobacco around the uncovered roots, or wetting the ground with the tobacco spray, sulphur lime or kerosene emulsion will kill a small proportion of the root aphis, but is never likely to give complete satisfaction. The root aphis does not penetrate deeper than eighteen inches below ground. In giving a root treatment it is best to uncover as much of the roots as possible before applying the insecticide. Banding the trees with



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You find it helpful;  
You are in earnest about

## "Better Fruit"

Tell your fruit-growing neighbors  
about it. Help us in this way to  
help you.

## Hood River Nurseries

Have for the coming season a very complete line of

### Nursery Stock

Newtown and Spitzenberg propagated from selected bearing trees. Make no mistake, but start your orchard right. Plant generation trees. Hood River (Clark Seedling) strawberry plants in quantities to suit

SEND FOR PRICES

RAWSON & STANTON, Hood River, Oregon

tree tanglefoot, applied over a band of cotton, will keep the root form from migrating up the trunk to locate on the branches. In that way the branches can be kept free from the woolly aphid. When the woolly aphid attacks a tree the tree is poisoned, swellings occur even during the first year of attack and the growth of the tree, as well as of the fruit, is materially stunted. The root form causes gall-like swellings, preventing the root action, and in the course of a few years causing decay of the roots. After a few years the tree is so undermined and weakened that it is practically killed. The woolly aphid is one of those insidious pests which should not be permitted to gain a foothold in the orchard.

#### LIST OF EXPERIMENTS

The following is the list of the experiments to be conducted by the Oregon Experiment League of Oregon Agricultural College during 1912:

##### *Animal Husbandry Investigations*

Horse feeding, varying amounts of hay for horses. Hog feeding, skim milk as a supplement to grain for fattening. Hog feeding, hay and kale for brood sows. Hog feeding, tankage for hogs in Eastern Oregon.

##### *Poultry Husbandry Investigations*

Poultry breeding for egg yield; natural and artificial incubation; poultry fed for eggs for market; comparisons of free range and confinement during winter on egg yield.

##### *Horticulture Investigations*

Blooming periods of fruits, for assistance in pollination work; experiments in thinning fruits; the use of cover crops and shade crops in orchards; experiments in orchard tillage; use of commercial fertilizers for nursery stock and for mature trees not making sufficient growth; determination of various walnut stocks for various districts; determination of best time for summer pruning; commercial value of dwarf fruits in Oregon; observation of frost and frost fighting; adaptability of different fruits to various parts of Oregon.

##### *Vegetable Investigations*

Cabbage storage; celery troubles, pithiness and running to seed; seed troubles, unreliability and unevenness of germination and lack of trueness to type of commercial garden seeds; home selection of garden seeds; hill selection of potatoes to increase yield; to prove importance of crop rotation in the home garden; possibilities of broccoli as a practical garden crop for Oregon; co-operative variety tests of various garden vegetables.

##### *Landscape Garden Investigations*

Adaptation of various bedding plants to Oregon; use of ornamentals in landscape in different sections of Oregon; adaptation of certain shade trees to local conditions; hardy perennials for the home garden; determining the best ornamental vines in Oregon; holly growing as an industry.

##### *Entomological Investigations*

Cabbage and radish maggot; the onion maggot; the Western potato flea beetle; the onion thrips; the currant fruit fly; the codling moth, observations in different sections; the bud

moth—fall spraying for its control; the woolly aphid—experiments for control; the brown apple aphid—experiments for control; the peach and prune borer—methods of prevention.

##### *Pathological Investigations*

Shading to prevent sunscald of prunes; variety tests of potatoes for wilt resistance; variety of fertilization of tomato to note effect on Western tomato blights; fertilization and cultivation of the apple—effect on fruit rot or dry rot; brown rot of prune or peach; twig blight and fruit-spot of peach; leaf-curl of peach; apple scab; anthracnose; pear scab; seed treatment of spring oats; seed treatment of wheat; seed treatment of barley; treatment of seed potatoes for scab.

##### *Dairy Investigations*

Relation of age to per cent butterfat in milk, to total production; kale for summer feeding, time to feed, quantity daily; maximum daily rations of other soiling crops; relation of size of animal to quantity of soiling crop in daily ration, including roots; yield per acre and cost per ton of various soiling crops; sex theories.

##### *Agronomy Investigations*

Alfalfa growing on dry land—one-quarter-acre plots; corn growing on dry land—one-quarter-acre plots; field pea growing on dry land—one-quarter-acre plots; brome grass and meadow fescue for pasture, for hay—one-tenth-acre plots; milo maize as a dry land crop—one-quarter-acre plots; numerous factors concerning alfalfa growing—one-acre plots; numerous factors concerning corn growing—one-acre plots or smaller; numerous factors concerning barley growing—one-acre plots; adaptability, smooth brome grass, meadow fescue, orchard grass—one-quarter-acre plots or larger; variety, number of eyes, number of cultivations of potatoes—one-acre plots; numerous factors concerning irrigation—comparison of yield, etc.; fertilizer requirements of various soil types and of different crops—one-tenth-acre plots; various factors concerning the growing of beans as a field crop—one-tenth-acre plots; possible yields of kale,

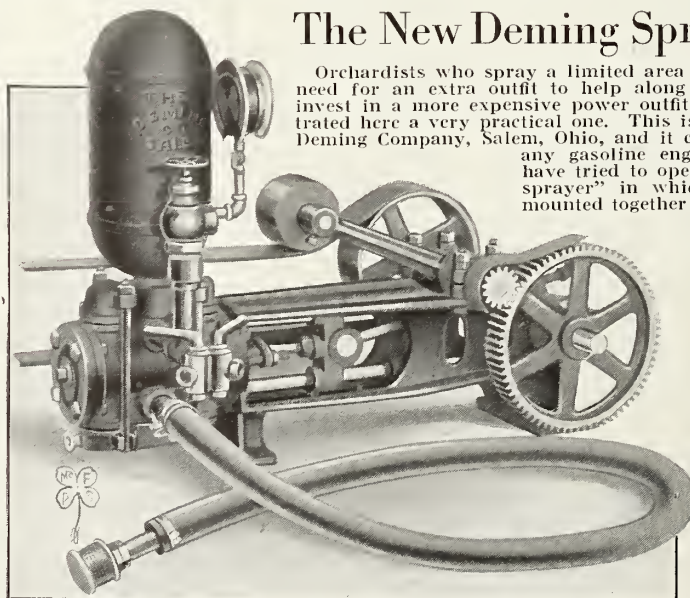
clover, vetch, corn, beans and potatoes—grown on red hill land.

The Oregon Agricultural Experiment League will be better able to carry out its purposes with a large membership. With the help of each member we should reach the thousand mark inside of the next 366 days. You undoubtedly know at least a dozen people who would be interested in carrying on experiments. Why not speak to them about it? The league wants them as members and they need the league. In order to make the league of value to the members it is necessary that you should carry on the experiment in as nearly as possible the way in which they are outlined. Do not hesitate to communicate with league headquarters whenever you are in doubt or whenever you have any results to report. Every experimenter should make it a point to report on all the experiments which he has undertaken at least once during the year, so that the information may be available when it is needed. The league has a big work to do, which it will accomplish only through the constant co-operation of the members of the league.

The Oregon Agricultural Experiment League was founded during the winter of 1911 for the purpose of carrying on investigations in all branches of agricultural endeavor to the end that all lines of the industries should be benefited. The members can make themselves the means of bringing to light and of verifying much important knowledge. The league holds its annual meeting during Farmers' Week at the Oregon Agricultural College. The headquarters of the league are with the Extension Division at the Oregon Agricultural College, and the league is affiliated with the Oregon Agricultural College. It is, however, an entirely separate organization, and in no way is controlled or governed by any influence or anyone except the individual members. The dues of the league are one dollar a year, and although members are urged to undertake experiments you may become a member without doing so.

## The New Deming Sprayer, Fig. 765

Orchardists who spray a limited area or who occasionally have need for an extra outfit to help along and who do not care to invest in a more expensive power outfit will find the outfit illustrated here a very practical one. This is Figure 765, made by the Deming Company, Salem, Ohio, and it can readily be attached to any gasoline engine. Fruit growers who have tried to operate a "home-made power sprayer" in which pump and engine are mounted together know that it is practically impossible to keep them



always in alignment; one or the other is always working loose, wasting power and reducing pressure.

The Deming Figure 765 pump is furnished with an attachment for keeping the belt always just tight enough, and the customary accessories such as pressure gauge and suction hose are also included. The net weight is about 200 pounds. Complete information can be obtained from the manufacturers or from their Pacific Coast agents, Crane Co., with offices at Portland, Seattle, Spokane, San Francisco.



# Stark Delicious Apple Again

## Smashes All Records in 1911

**Leads every variety in Wenatchee Fruit Growers' Association List for 1911.—F. S. Burgess of Chelan County, Wash., makes \$882.93 net from 36 ten-year-old-trees**

Again, yes again, Stark Delicious has proven its claim to the title of "biggest profit-producer among all apples." For in 1911 it has again outclassed everything in the apple line by the big prices it brought its growers, just as it did in 1910, 1909, 1908. Spitzenberg, Winesap, Jonathan, Newtown—all of them, and the best ones, too, fell \$1.00 per box or more behind this wonder apple in selling price.

And think what that extra dollar means to the season's profit on the crop.

### Tops Wenatchee Ass'n List

Here are the prices made public about January 1st, of the Wenatchee Fruit Growers' Association, one of the strongest fruit growers' organizations in the West:

Stark Delicious..\$2.75	Grimes Golden ..\$1.35
Stark Black Ben. 1.24	Winter Banana .. 1.50
Ben Davis ..... 1.00	Stayman Winesap 1.41
Senator ..... 1.35	Jonathan ..... 1.44
Black Twig ..... 1.26	Rome Beauty.... 1.44
W. W. Pearmain 1.32	Spitzenberg ..... 1.80
Stark King David 1.40	Winesap ..... 1.80

These figures, Mr. Fruit Grower, tell a story of big, vital importance to you. We can't add a word that would make it stronger.

### \$882.93 Net Profit from 36 Trees

Stark Bro's, Louisiana, Missouri—Dear Sirs: "On December 18, 1911, you asked me for a report on my crop of Stark Delicious from my 36 trees, 10 years old. It was impossible to make a report at that time, as I did not have full returns until the present date. The report will not be so good as last year, but it is good considering the general short crop in this valley this year."—F. S. Burgess, Chelan County, Washington, January 22, 1912.

"Report of crop of Stark Delicious for the year 1911: 36 trees (10 years old) set in square form, 20 feet apart each way.  
26 boxes Extra Fancy, at \$2.33.....\$612.79  
58 boxes Fancy, at \$2.08..... 120.64  
87 boxes 'C' grade..... 149.50

\$882.93

"These prices are net—all freight, warehouse and marketing charges have been deducted."  
(Signed) F. S. Burgess,  
Chelan County, Washington.

### \$1,500.00 Net Profit Last Year

In the fall of 1910, from these same 36 Stark Delicious apple trees (then 9 years old), Mr. Burgess harvested a crop that netted him \$1,500.00.

—\$2,382.93 net from two successive seasons' crops, or \$33.10 net per tree per crop! And these 36 trees occupy only one-third of an acre of ground.

If you are interested in the business of fruit growing for the profit there is in it, we cannot give you better reasons why you should plant Stark Delicious than these true records. We have hundreds more of them—they all tell the same story of big profits—bigger profits than any other variety has ever earned.

### Our Prices Lowered for 1912

Because our volume of business on Stark Delicious has been tremendous we offer for Spring 1912 trees of this world-famed variety at 10 cents per tree cheaper than last year.

The enormous demand for Stark Delicious trees has made it possible for us to grow them in greater quantity (more than 3,000,000 propagated for 1912 trade) and better quality than ever before, and thus lower the cost of production. You get the saving.

These low prices are subject to 25% discount for cash with order.

#### ONE-YEAR TREES

2 to 3 feet—		
Each .....\$ .30	100.....\$ 23.00	
10 ..... 2.70	1000..... 180.00	

3 to 5 feet—		
Each ..... .40	100..... 32.00	
10 ..... 3.70	1000..... 265.00	

#### TWO-YEAR TREES

X, 3 to 4 feet—		
Each .....\$ .30	100.....\$ 23.00	
10 ..... 2.70	1000..... 180.00	

XX, 4 to 5 feet—		
Each ..... .40	100..... 32.00	
10 ..... 3.70	1000..... 265.00	

XXX, 5 to 7 feet—		
Each ..... .50	100..... 40.00	
10 ..... 4.50	1000..... 330.00	

300 trees or more are sold at the 1000 rate.  
30 trees or more are sold at the 100 rate.  
10 trees and less than 30 are sold at 10 rate.  
Less than 10 are sold at the Each rate.

### Don't You Pay Freight

Let us do it. We pay freight on orders of \$10.00 net or more. We also box and pack free. The Stark Method of Packing is world-famous—it is so good that we guarantee safe arrival.

### Don't Delay Ordering

As mammoth as our stock of Stark Delicious trees is, it is not going to supply the demand. There are bound to be some planters, who delay ordering till the last minute, who will be disappointed. Orders are piling in now every day that keep our great force on the jump. You can't lose anything by ordering immediately. On the other hand you gain. Early ordering means perfect trees, carefully selected, carefully packed, and delivered at your station the day you want them.

### 8 Mammoth Nurseries in 6 Different States

It is a proven scientific fact that no one soil or climate will grow all kinds of trees to the height of perfection, and

since the Stark standard of tree quality demands that every tree be as perfect as it can be grown, we have eight great nurseries in six different states.

Eighty-six years of tree-growing know-how is back of every Stark Tree. Four generations of Stark men, scientists and expert horticulturists all of them, have devoted their lifetime to this one business. Better trees than Stark trees cannot be grown.

Don't make the fatal mistake of planting trees of questionable quality. Plant Stark Trees, with an 86-year reputation for dependability behind them. Then you can never be disappointed.

### Remember, These Are Exclusive Stark Features

- Lower prices for 1912.
- 25% discount to mail order buyers.
- Freight paid on orders, \$10 net or more.
- Free boxing—free packing.
- Guaranteed safe arrival of trees.
- Special Service Department Advice to Growers.
- Free books.
- Exclusive varieties of prize-winning fruit.
- Three-quarters of a century reputation for square deal behind every Stark product.
- A million-dollar nursery behind every statement made and every Stark tree sold.
- Fast daily refrigerator freight service.

### Stark Orchard Planting Book

#### "Master Book of Master Minds"

Trustworthy information written by the great horticulturists of our Special Service Department—given free to the whole world. Not a catalog or piece of advertising, but a well of information; as the authors say:

"The contents is not the result of our own experience alone. It is a collection of the knowledge and experience of many men. Each has spent a large part of his life working with trees. Many have had scientific training. All are rich in that greatest of all knowledge—practical experience." It tells the real secret of success in orchard planting.

Also Free—Stark Condensed Year Book, "A diamond mine of information." This valuable book makes money for every man lucky enough to send for his copy. Old, experienced orchardists find almost as much helpful information in this book as do beginners. Our complete catalogue included. Editions are limited—send for your copies today. Use coupon.



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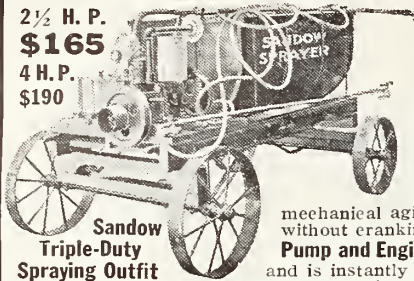
312 Stark Station LOUISIANA, MO.

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT





**2½ H. P.  
\$165**  
**4 H. P.  
\$190**



**Sandow  
Triple-Duty  
Spraying Outfit**

Price includes tank wagon with shafts, agitator, high-duty spray pump, gauge, relief valve, hose, two extensions, two nozzles, strainer, clutch, patent pump jack, and engine with complete equipment. All mounted, ready to run. For full particulars, send for Bulletin 501

**DETROIT MOTOR CAR SUPPLY CO.,**

## Spraying

with an outfit that you can use all the year means dollars to you. Here is a triple-duty outfit for the price of a single rig.

**Engine is Simplest, Most Powerful Made**

Connected to powerful spray pump by patent jack, with clutch movement, and operates without cranking; thoroughly reliable.

**Pump and Engine Can Be Removed From Truck in 4 Minutes**

and is instantly available for other work. The clutch allows you to use the engine for any other duty.

**DETROIT, MICH.**

## Maxwell Automobiles, Supplies and Accessories

GOODYEAR AND MICHELIN TIRES

Up-to-Date Garage and Machinery Shop

**Tip Top Auto Company,** Columbia Avenue, Hood River, Oregon

## Combating Dandelions in Lawns

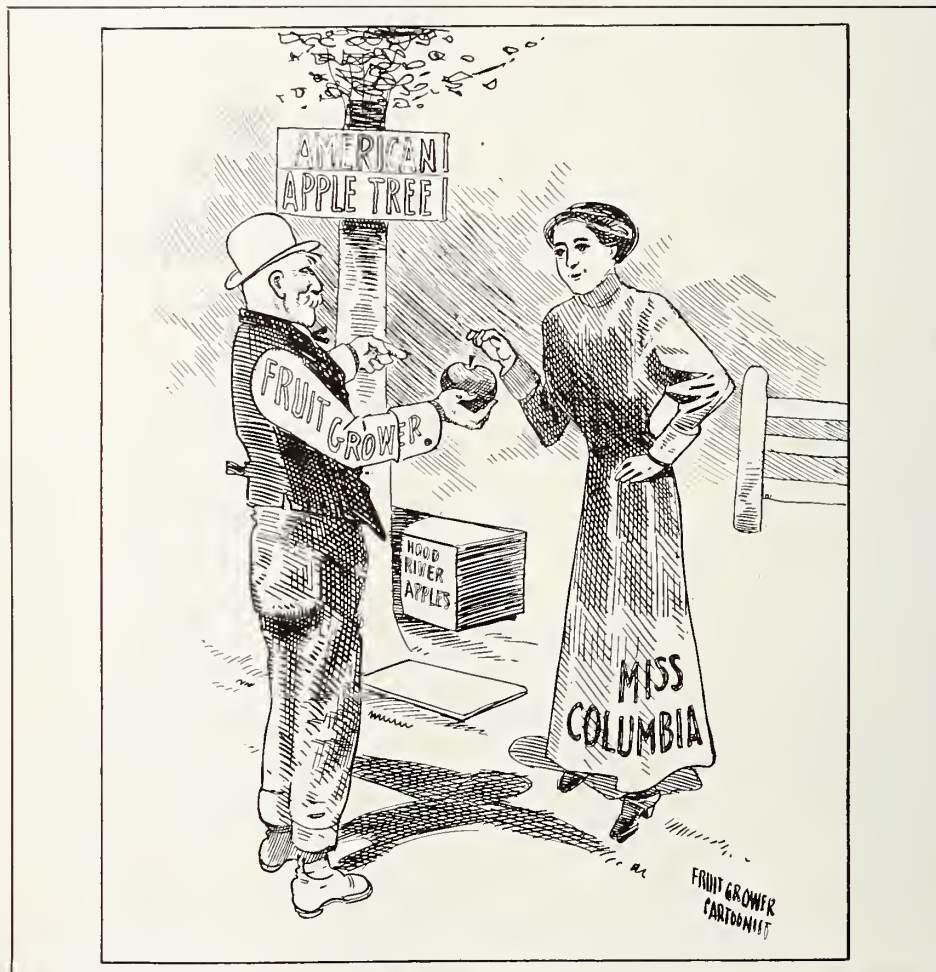
By Professor R. Kent Beattie, Botanist, Washington State College, Pullman

THE common dandelion is on the increase as a pest in the lawns of Eastern Washington. It is a very difficult plant to eradicate. It perpetuates itself by a large, fleshy root which is difficult to kill, and this must be removed before one can get rid of the plant. A very common method is to dig out as much of the root as possible with a long, heavy knife, or with a tool called a spud, and then to put a few drops of coal oil on the cut surface of the root. In many cases the coal oil kills that part of the root which remains. It is, however, not perfectly successful. Some persons have tried sulphuric acid on the roots. This is a difficult thing to handle, for it is very injurious to the hands and the person. It usually kills the dandelion roots, but in some cases they escape. Recently a good many people have tried spraying for dandelions, and this is recommended by some. The method used is to make a solution of iron sulphate, two pounds to one gallon of water. Apply this to the lawn with a spray pump so that it will make a fine mist. Some people put half an ounce of sulphuric acid in each gallon of the spray. In any event, all that this spray can do is to kill the tops. If, however, one should begin in the spring and kill the tops with the spray and then repeat the

process as often as new ones appear, one ought in time to get rid of the roots by starving them out. This spray does little or no injury to lawn grass and clover. It sometimes blackens the edges of the leaves a little, but the damage is never serious. From the standpoint of cheapness and ease of application at least, this is probably the best method to use in fighting the dandelion.

Compliments "Better Fruit." — The Burlington Route in a recent booklet issued for the benefit of farmers says: "And one who is engaging in apple or other fruit production should familiarize himself with the more important literature concerning the same. There are several books published which deal with fruit growing in general, that one should have. 'Principles of Fruit Growing,' by Bailey, and 'Fruit Growing,' by Professor Green, are two of the more important ones. It would be well for the prospective fruit grower to take some monthly magazine on fruit growing, and of these the two best for the apple grower would probably be 'The Fruit Grower,' St. Joseph, Missouri, and 'Better Fruit,' published at Hood River, Oregon." "Better Fruit" feels very much pleased over this recognition coming from a railroad operating in a territory so far distant from the Pacific Northwest.

The new 60-horsepower Caterpillar gasoline traction engine built by the Holt Manufacturing Company, Stockton, California, is rapidly proving its merits as an orchard tool. Although it weighs 18,000 pounds, the weight is so distributed that it is less than six pounds to the square inch. Its weight also is only 300 pounds to the horsepower. The Caterpillar, therefore, easily travels over the soft cultivated ground of an orchard without packing the soil. By means of its peculiar construction, each track being worked independently of the other, the tractor is easily steered and can be handled in a young orchard with less injury to the trees than ordinary teams. A number of sales have been made during the last month for clearing land and orchard work. Plowing, cultivating and management of the orchard can be done at one-third of the cost of present methods, by employing a Caterpillar.



### Full-Bearing Apple Orchard

Finest in Lawrence County, Ohio

For Sale at Great Sacrifice

On account of ill-health of owner.

250 Acres, 20,000 Trees in One Block

Sold as a whole or in blocks to suit.

### Apples Sell Higher

In Lawrence County than in Washington or Oregon. Prices obtained last two years prove this assertion.

For particulars address

C. M. Davidson, Chesapeake, Ohio, No. 1



# The Condition of Fruit Growing in Foreign Lands

From the Hood River Glacier

A SPEECH of much interest to fruit-growers was recently delivered before the Hood River Commercial Club by Mr. O. P. Dabney, who recently returned from a six months' trip in Ireland, England and other European countries. The greater part of Dabney's address was taken up with his observations on the apple industry abroad and was of special interest to local men, most all of whom are interested in orchards.

"While I am not directly interested in fruit culture," said Mr. Dabney, "I have made as many observations as possible on my tour. The most of the apples sold in London and other cities of Europe are shipped from Tasmania. In traveling through North England and Scotland one will see but few orchards, that is, where they are raised commercially. In some parts of Ireland a good many orchards may be found, yet they are woefully uncared for. In going from Londonderry to Dublin I passed through what is known as the great apple belt, where they have been raising the fruit for the market for the last two hundred years. Yet, as in other countries, the land is crowded to its fullest capacity. The rows of trees are about twenty-five feet apart. Between them rows of small fruits are set, and vegetables of different kinds are grown in the intervening spaces. The Irish do not thin their fruit on the trees, nor do they prune or spray them, consequently their apples are small. South Ireland has a few orchards, and the same conditions prevail as in the north country. On the south coast of England a great many apples are raised. The growers there use extreme care in the picking, using big baskets and some attempt to sort and pack. In Belgium and Holland there are practically no apples grown for the market and but few home orchards. In parts of Germany and in the very southern part of Holland there is big acreage of young trees from two to three years old. North France has practically no apples, while in the south and central parts a good many are grown. The trees receive proper treatment and fruit from this region brings better prices than any other European apples. However, the growers do not realize the value of proper pruning. The very few good orchards in Switzerland are to be found around Lake Geneva. In some parts of the country they preserve that old custom of planting an apple tree at a birth or wedding, and the fruit trees are of various ages, and for the most part are set in meadow and pasture land. On

Lake Lucerne I saw a number of specimens of the dwarf and climbing apples. One may wander through arbors of the climbing trees and pick fruit, or reach out of his third-story bedroom window in the morning and pluck an apple for breakfast. On the Upper Rhine a few orchards are found, but they are usually uncared for, having been planted in woodland and meadow. In France,

a part of Switzerland and the Rhineland, by toil and perseverance, the people have made available thousands of acres of vineland, the steep, stony hillsides having been terraced with strong stone walls. The terraces range in size from a double bed blanket to several acres in extent; yet the vineyard owners have their troubles with pests and diseases. At seasons of the year school children, armed with sticky lime and fans, are used to kill the dread moth."

## Our Apple Trade in Scotland

Consul Rufus Fleming, Edinburgh, in Daily Consular and Trade Reports

SCOTLAND is not an apple growing country owing to adverse climatic conditions. Neither in quantity nor quality is the domestic production a factor in the market, the long established houses that dominate the trade drawing practically the whole of their supplies from abroad, principally from the United States and Canada. The apples handled by wholesale firms here are largely bought at the auction marts in Liverpool and Glasgow, but considerable quantities are purchased from foreign shippers through the London brokers, including the American cased apples, such as California and Oregon Newtowns and Wenatchee Valley varieties. The total sales of apples in Edinburgh and vicinity are roughly estimated by brokers and wholesalers at 60,000 barrels in an average year. Generally speaking, better grading of Canadian apples has benefited Canadian shippers, but the United States has two distinct advantages in this trade: (1)

Fresh apples are exported practically at all seasons, from one part of the country or another; (2) in quality and appearance some American varieties grown in Michigan, California, Washington, Maine, New York and other states of the East and West are superior to the best commercial grades produced elsewhere.

Probably the most successful method of building up the trade in high grade cased apples in this part of Scotland would be to deal directly with the principal local wholesale firms whose names appear in the World Trade Directory, published by the Bureau of Manufactures. Each of these firms is in a position to handle effectively any special line of fresh fruit. I give below the wholesale prices—which average about fifteen per cent more than auction or brokers' prices—of all varieties of imported apples in the Edinburgh market on December 6, 1911:

APPLES		Net weight Pounds	Market price
<i>American (in barrels)</i>			
Ben Davis .....	112 to 130	\$2.55 to \$3.16	
Newtowns .....	120 to 126	3.16 to 4.87	
Baldwins .....	112 to 133	2.92 to 4.38	
Cranberry Pippins .....	112 to 126	3.16 to 3.65	
Rox Russets .....	120 to 126	2.43 to 3.04	
Golden Russets .....	112 to 126	2.92 to 3.65	
Seek-No-Further .....	120 to 133	2.92 to 3.40	
Spitzenberg .....	120 to 126	3.40 to 3.89	
Pride of the Hudson .....	126	3.65 to 4.13	
York Imperials .....	126 to 140	3.89 to 5.35	
Greenings .....	126 to 133	3.40 to 4.13	
Northern Spies .....	126	3.16 to 4.13	
Vandavers .....	112 to 126	2.92 to 3.40	
Wageners .....	120 to 126	3.16 to 4.38	
Phoenix .....	126	2.92 to 3.65	
<i>American (cased)</i>			
California Newtowns, 4-tier .....	40	2.06 to 2.19	
California Newtowns, 4½-tier .....	37	1.82	
Oregon Newtowns, 4-tier .....	40	3.65 to 3.89	
Oregon Newtowns, 3½-tier .....	37	3.89 to 4.01	
Wenatchee Valley apples:			
Winter Bananas .....	28	3.40	
Rome Beauties .....	40	2.06 to 2.19	
Jonathans .....	36	2.19	
Black Twigs .....	38	1.82 to 1.94	
Willow Twigs .....	40	1.82 to 1.94	

NOTE—Weights of American apples vary greatly, and little or no effort is made to select ones and twos. Each parcel or mark is bought or sold on its merits.

APPLES		No. 1 Net weight Pounds	Market price	No. 2 Net weight Pounds	Market price
<i>Canadian (in barrels)</i>					
Baldwins .....	144	\$4.62 to \$5.11	151	\$3.65 to \$2.89	
Seek-No-Further .....	140	4.26 to 4.50	147	3.65	
Ben Davis .....	140	3.28 to 3.52	147	2.80	
Spies .....	144	4.13 to 4.87	154	3.65 to 4.38	
Phoenix .....	144	4.38 to 4.87	154	3.89	
Talman Sweets .....	140	2.80 to 3.04	147	2.55 to 2.67	
Golden Russets .....	144	3.89 to 4.87	154	3.40 to 3.89	
Rhode Island Greenings .....	144	4.38 to 4.87	154	3.65 to 4.13	
Starks .....	147	4.13 to 4.38	154	3.65 to 3.89	
Stone Pippins .....	140	3.89 to 4.13	147	3.40 to 3.65	
Ganos .....	140	4.13 to 4.38	147	3.89	
Canada Reds .....	144	4.38	154	3.65	
<i>Nova Scotian (in barrels)</i>					
Kings .....	120	3.65 to 3.89	126	2.67 to 2.92	
Starks .....	126	3.16 to 3.40	133	2.47 to 2.92	
Baldwins .....	126	3.28 to 3.65	133	2.67 to 2.92	
Greenings .....	126	3.16 to 3.40	133	2.67 to 2.92	
Ribstons .....	120	2.92 to 3.16	126	2.43 to 2.67	

WANTED—A position as horticulturist. Have had two years' course at Washington State College and three years of practice. Can give good references. Address V. C. K., care "Better Fruit."





## Why the Improved Johnson Tractor Walks on Plowed Ground

There is but one correct principle for traveling over plowed ground; the principle of a horse's hoof. Developed by centuries of natural selection, man, with all his ingenuity, has never been able to devise a better method of travel on soft ground than nature's way.

### The Improved Johnson Tractor

Embodies the only mechanical adaption of nature's method, a feature covered by broad patents. Examine the section of wheel shown in the picture above. Note that every tread as it approaches and is set on the ground, as it carries the weight, and as it lifts from the ground, conforms to nature's principle. Compare the wheel tread with the full motion of a hoof, as shown in the lower half of the picture. This picture tells better than any words why the Improved Johnson Tractor will pull cultivators in the soft dust mulch of your orchard as well as plows in the heaviest sod. Note how the edges of the tread when lifting from the ground break the little packed spot ordinarily left by a hoof. This means an even dust mulch, and prevents forming of trample pan.

Each turn of the drive wheel is a steady walk forward, just as a horse would do.

### Weigh These Advantages

Instead of the pull of a single team you have the pull of seven teams.

Instead of making six to eight rounds between each row of trees, you clean up the entire row in one through, or one round at best.

Instead of one-fourth your time spent in blowing the team, you spend fifteen minutes twice a day oiling up.

At the end of summer, instead of a hard trample pan just under your dust mulch, it is of even texture throughout its entire depth.

Instead of a feed cost of 47¢ cents per horse per day, you have a fuel cost of 2¼ cents per horse pull per day.

This iron horse has REDUCED growing COSTS ONE-HALF for many California growers. What it has done in other orchards it will do in the apple orchard.

**If you work ten or more horses, economy dictates your investigation**

*Write today telling the size of your orchard, soil, intercrops and cover crops, types of implements; full details, so that our orchard man can give you immediate personal attention.*

## JOSHUA HENDY IRON WORKS

Sixty-Seven Fremont Street

San Francisco, California



This shows the Improved Johnson Tractor working in the Sacramento Valley. It is a plain farm tool, as easily handled and kept in working condition as the plow it pulls. For the man or group of men who use ten or more horses in orchard or field, it is a necessity.



Continued from page 37

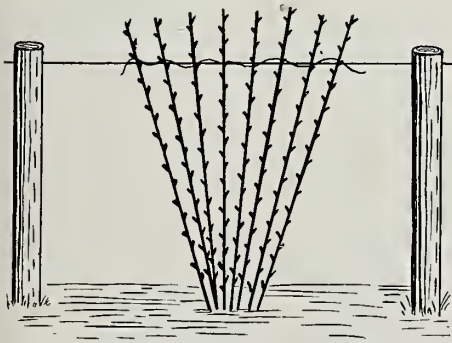
It is important that the fruiting canes have an upright position early in the fruiting season to have the advantage of light and an unimpeded flow of sap, thus giving them the vigor needed to develop the fruit spurs and fruit or the new canes will weaken them by their quick succulent growth.

The best system of managing the canes is that which exposes every cane to the sun and causes them to grow in an upright position without interference by secondary causes.

To secure this the row system will give best results, with the hills planted three feet apart in the row and the rows eight feet apart, and for small garden culture two by five feet.

Supports should be provided, to which the individual canes are fastened. To accomplish this posts are set eight feet apart in the row, and to the posts are nailed strips of wood one by two inches wide and sixteen feet long, or (especially for commercial use) galvanized wire should be substituted. The height of the support should be five and a half feet from the ground, and from post to post.

In 1895 I devised and introduced the string method of tying the individual fruiting canes for their control and also of training the new growth to grow erect and separate from the fruiting canes by use of the string method, as follows:



Best Method of Controlling the Erect Growing Canes. This affords easy gathering of the fruit, as there is no lower wire to interfere. Introduced by J. F. Littooy.

The fruiting canes are spread out over each hill three canes each way and spread six inches apart, and secured to this strip or wire with a cheap white cotton ball twine, and every turn of the twine secures a cane. To release the old canes after fruiting, when ready to cut out, a knife is drawn along the back of the strip of wood, cutting the twine, or by burning the twine from wire with candle or torch.

This system allows six strong fruiting canes to each hill growing erect and six new ones for next year's fruiting, the old canes being tied to the wire. The new canes must also be supported to grow erect, and to accomplish this a similar twine is brought above them as high up as possible to their terminals, when they are four feet tall. The twine should be drawn sufficiently loose so as to let the canes grow in their natural position. This twine should be fastened to the strip of wood or wire above to a point over the center of each hill.

The new canes of the semi-vinous varieties grow erect until after they attain this height, and this simple method is effective to keep them in their position to grow rigid and pre-

vent them being top heavy, causing the evil results mentioned.

The rows should be planted if possible east and west. This will permit of more light, which will draw the new growing canes to the south, exposing them to plenty of sun and air to develop them. This plan permits the fruiting canes to be intermittently shaded from the direct rays of the sun.

This system affords the largest specimens of fruit, and the size of the fruit is of much economic importance, since the demand will be greater, sales made quicker and remuneration larger.

This system provides for gathering the fruit easier and quicker than any other, as the fruit is all well exposed. This is important, as the more money the pickers can earn the more demand there is for the privilege of picking.

Like the hill system, the pickers can go between and all around each hill rapidly, completing their work as they go with no vines or trellises to interfere, or breaking or bending of canes by pickers, cultivators or other causes. This is an important item.

The new system of suckering is an important one, and which I first devised and put into practice in 1895. All surplus canes are termed suckers, and while young are either pulled or cut out. Cutting them out is an error, since the balance is only broken between root and top of the sucker, and the dormant buds remaining at the base of shoot below cut will awaken and develop many more suckers.

Six of the best young canes on the original stool should be chosen and

the balance should all be pulled out by hand when about eighteen inches high, thus securing root and all. While selecting the canes which are to remain one should exercise care not to select any affected by the cane maggot, as explained later.

There should be no delay about suckering the hills at the right time, as the suckers grow very rapidly, and if delayed for a few days they are harder to pull and the spines harden, scratching the hands, and the surplus canes shade the desired ones and take much nourishment from them.

After a little practice of suckering the hills one will learn to choose the main canes by observing if they are growing from the base of the fruiting canes and allow one new cane to develop from each fruiting one. If there are less than six fruiting canes then allow two shoots to grow from each fruiting cane until the desired number is secured.

Suckers will grow again about three weeks later, and these should be pulled out without delay.

With this system of suckering all energy of the plant is concentrated upon a few canes; as a result they are very stocky and tall, and any cane shorter than six feet is an exception. The average height is about eight feet, and in very fertile soil taller than this.

If the canes do not grow excessively tall they should be tipped back when leaves are off to about six and one-half or seven feet, a convenient height for picking.

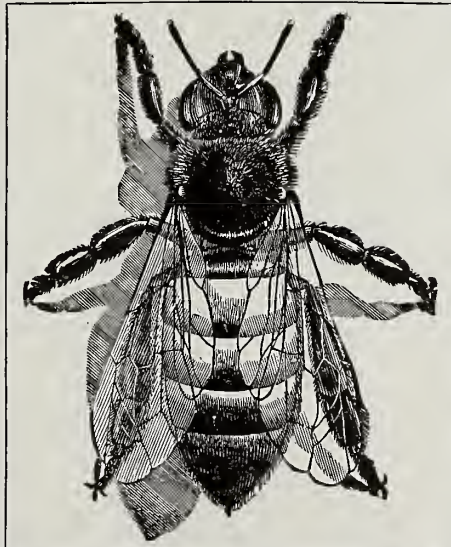
As every bud produces fruit, some growers object to cutting back any

## "Apple Growing in the Pacific Northwest"

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INCREASE THE YIELD and  
SIZE OF FRUIT—IM-  
PROVE THE COLOR and  
FLAVOR**



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WE ARE Western Agents for the A. I. Root Co., and carry the largest and most complete stock of Bee Supplies in the West. Ask for Catalog No. 203



**Portland Seed Co. PORTLAND OREGON**



of the top. While more berries are produced by not cutting back the top, yet the quantity is no more, since the terminal of the cane produces too much fruit at the expense of the size of fruit on the lower spurs of the canes.

The reason for this is that all surplus nourishment is focused at terminal points; therefore the terminal spurs on the cane as well as the terminal berry on each spur ripens its fruit first (hence larger), and in that order towards the base of spur and base spur on cane until at what is called the height of the ripening season when a large bulk of the fruit ripens apparently all at once.

The supply of nourishment is rapidly being exhausted while being diffused to ripen so much fruit all at once, and the size of the berry diminishes. If the top of the cane is cut back sufficiently the balance is broken and more nourishment is placed to the remaining fruit buds, and the fruit will be larger and the strain less because of fewer seeds to develop at the height of the season; thus also the base buds of both spur and at base of the cane will receive more vigor and nourishment and cause the fruit at these weak buds to become larger and the period of the ripening season much extended.

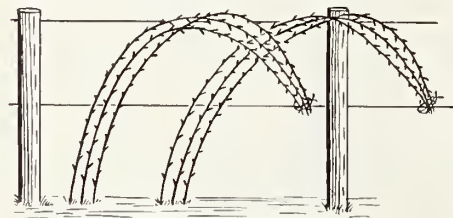
Then the leaves on the top of the cane, being smaller than those below them, the fruit buds are smaller, and hence the fruit spurs smaller, thus containing fewer berries. The buds on

the terminal of the cane being close together the fruit spurs are close together, and hence a large quantity of fruit in small clusters at this point; and since nourishment first goes to terminal points on account of the best position for light this lot of fruit has the advantage. On account of this quantity of spurs and few berries on each spur they ripen practically all at once, therefore are not sufficiently large for the position they occupy, and take the nourishment suddenly from the better buds and fruit below on the cane at a time when most needed.

Canes grown on this system, fully exposed to the sun from its base up during the previous season's growth, will produce fruit a foot from its base to the top of cane, hence plenty of fruit, and the top of the cane may well be spared.

If the canes grow very tall they should not be cut back, as it proves that the nourishment and moisture conditions are such that the cane can well mature all its fruit, and to cut back severely would result in putting too much vigor to the new growing canes, making growth more rank only to be cut back another season. Extremes are wasteful and should be avoided.

For tall growing canes like the Cuthbert, especially when growing in a rich and moist soil, a second wire will be needed two and one-half feet below the other and three and one-half feet from the ground. The fruiting cane (when the leaves are off) is passed over the top wire and its tip then fastened to the lower wire. There should be a gentle arch to the cane from the base to its tip and all the canes in the row should be bent in the same direction. The new canes of the current year's growth should be controlled as previously described, only a second string will be necessary higher up to keep the new canes growing erect, as being top-heavy they will easily bend, and this must be avoided.



The Best Method of Controlling Tall Canes of the Semi-Vinous Raspberry, and introduced by J. F. Littoy

The immense yield from such a patch responds amazingly to any extra attention given it. It might appear to some that there is much work involved fastening the canes in the manner described. A boy or girl will fasten the canes at the rate of about an acre a day, and the profitable results obtained as outlined warrants cost.

The cost of the twine will be about 75 cents per acre.

Methods of cultivation depend upon soil conditions, which are many. The base principle of cultivation is to govern moisture conditions and nourishment.

If the soil is of good texture and of sufficient depth to hold moisture and act as a reservoir, then through capillary attraction the plants will be supplied through a dry season in proportion to the capacity of nature's reservoir to hold water.

## TREES

Not little sprouts or saplings, but healthy specimens with perfect

## ROOTS

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### 20,000 Acres

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Some soils are penetrable, deep and unbroken by streaks of gravel, hardpan, etc., permitting of perfect capillary action from the reservoir or soil depth filled proportionate to the rainfall, sub-waterways and irrigation.

Capillary action is governed by the size, condition and compact nature of the soil particles.

If the soil is loose the more rapidly will the surface dry out, and if the soil is of a compact nature it is more retentive of moisture, but capillary action is more perfect and rapid evaporation takes place.

Capillary action is also broken in proportion to the supply of humus (vegetable matter) the soil contains, as each particle of humus, like a sponge, holds water proportionate to its size.

Much humus, causing the surface soil to become too loose, may entirely break capillary action and dry out the surface soil if water is limited.

Humus has important agencies, that of holding moisture, loosening the soil, improving soil texture and furnishing plant food.

These few above general principles will assist one to understand and govern the conditions of successful cultivation.

Cultivating soils to secure a dust mulch by loosening the soil particles at the surface breaks capillary action, shades the moist soil, conserves moisture and liberates plant food.

If a soil is loose and shallow it must dry out quickly, and a dust mulch will only retard it in proportion to the amount of moisture the soil holds as a reservoir and the frequency of cultivation given. Cultivation should be frequent and shallow, as the moisture of both atmosphere and soil cause the soil particles of the mulch to adhere, thus impeding soil aeration and making capillary action more perfect.

It is important after every rain or heavy dews, which cause a crust to form on the surface of the soil, to break it by cultivation to conserve the moisture and air the soil.

While harvesting the crop the pickers compact the soil, and cultivation should follow immediately after picking to conserve moisture during the period when the drain is heavy on soil moisture.

If only occasional cultivation is given the moisture and nourishment conditions are proportionately unsteady, and it results in stimulating an unsteady growth, thus impeding its maturity, and is then subject to the ill effects of winter and disease. Any influence which would cause an unsteady growth should be avoided.

A mulch of humus to shade the soil and break capillary action is as

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Are the most efficient and improved of all Spray Pumps. You can't afford to use a poor pump when a genuine MYERS, the pump of service, costs but little more.

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PORTLAND-BOISE-SPOKANE





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## Blue Ribbon Orchard Special

**600 ACRES, SHENANDOAH VALLEY, \$7,500.00**

This tract of land adjoins one of the finest stock farms in the state and parallels the Norfolk & Western Railway. Elevation 1,200 feet; good clay subsoil and loamy topsoil. Right in fruit district and ideal for apples, peaches, plums and cherries. Well watered by two creeks; land lies nicely and free from stone.

**WOOD AND TIMBER WILL PAY FOR CLEARING**

Lies 75 to 100 feet above valley and above frost in spring. No finer fruit land in Virginia—right at railroad and station. Fine for commercial orchard, or good farm and grazing land.

It is being offered at about half usual price for immediate sale—\$12.50 per acre will buy it as a whole.

Reasonable terms of payment given. Address

**F. H. LaBAUME, Agricultural Agent N. & W. Ry.**  
Box 3047, Roanoke, Virginia

effective to conserve moisture as a dust mulch and it affords the bacterial agencies far more chance to liberate plant food. For small gardens mulching with humus would pay liberally.

Part mulch and part cultivating would be economy in field culture if the mulch could be provided.

Aside from manure the best humus mulch for the berries would be clover or alfalfa hay, especially if cut fine, and it would form an almost balanced ration for the plants, and the returns from such hay would be greater than when fed to cows. Clover hay as a mulch curtails hand weeding and con-

tains no weed seeds to germinate as in manure; it conserves moisture, prevents compacting of soil by pickers; it liberates plant food and induces nitrification; it insures a steady, even growth to maturity; it furnishes a humus supply, a balanced ration, larger berries, and the heavier yields in fruit will more than counteract its cost and in the end cost nothing. Thrashed straw is also an excellent mulch.

A balanced ration is important toward maturing the tissue of wood and fruit. If the soil contains too much nitrogen and not enough phosphates and potash the canes will grow rank and tender, through the cells being



immature, and thus subject to being winter killed, exposed to disease and the shipping qualities of the fruit lessened.

The potash in the cells of the pulp of fruit is what the shell of the seed is to its contents—a preserver.

If the plant is much deficient in potash it is not in a healthy condition, and if it survives the attacks of the elements of winter or disease then the plant, diverting its energy to the reproduction of species when in a weakened condition, causes the reproductive organs to have first claim to what available surplus nourishment the plant has and the seed taxes the already weak vitality of the plant to support it.

Since the seed requires the nourishment of a fairly balanced ration to support new life, the shell of the pit will, for its formation, use up most of the available potash at its command to harden its tissue to preserve its contents, and if the shell is surrounded by a pulp the cells of the pulp are weakened in proportion to the lack of potash the shell of the pit requires for its best development to protect the seed. Thus the importance of the plant having sufficient potash for all requirements of plant life and giving the fruit shipping quality as well as flavor and size.

If the soil should be deficient in potash it should be supplied in an available form, and if no material is at hand some high grade fertilizer, such as muriate of potash, should be used broadcast at the rate of about 250 pounds per acre. Poultry fertilizer and seaweed are rich in potash.

Some growers depend on barnyard manure as sufficient nourishment for plants. This contains little available potash unless all the liquid manure is retained, which is an exception, and unless kept under cover and proper care given it from leaching or exposure.

Liquid manure is valuable as a fertilizer, as it contains about equal parts of potash and nitrogen, and being available is of the highest value. "If diluted and intelligently placed to the proper plants for plant food, it is more profitable, quart for quart, than milk."

This statement should make many farmers think, also reflect back to the history of the success of many European farmers who, through the aid of

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Our specialty is Roses, grown at Hood River. All of the leading kinds and many of the new ones. From \$3.50 to \$5.00 per dozen.

Anyone contemplating planting their grounds with ornamental plants will do well to visit our nursery and see our stock.

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## Bearing Young Orchard in Virginia

100 acres deep rich soil. Mainly Winesaps. Probably \$3,500 crop this season. Splendid condition. Macadam turnpike. \$7,500. Details write Owner, Box 434, Lynchburg, Virginia.

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On an 80-H. P., 4-cylinder Hart Parr Traction Engine; used only six weeks. Write for full particulars to Reiersen Machinery Co., Portland, Oregon.



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OVER THE SCENIC HIGHWAY

## Daily Trains of Highest Order

**The Standard Railway of the Northwest  
has frequent trains from and through its  
chief cities to Minneapolis, St. Paul,  
Milwaukee, Chicago, Kansas City,  
St. Louis. Immediate connections to  
Duluth, Superior, Winnipeg and all  
points East and South.**

Service that Sets the Pace.  
Let us ticket YOU.

Full information gladly furnished on application  
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Assistant General Passenger Agent  
PORTLAND, OREGON

Annual Rose Festival, Portland, June 10-15, 1912  
Montana Festo, Tacoma, June 30-July 4, 1912  
Grand Lodge, Order of Elks, Portland, July 9-13, 1912  
Golden Poldach Carnival, Seattle, July 15-20, 1912  
Yellowstone National Park, Season June 15-Sept. 15, 1912  
Panama-Pacific International Exposition, San Francisco, 1915

# Northern Pacific Railway

Original, Direct and Only Line to Gardiner Gateway, Official Yellowstone Park Entrance

liquid manure, were able to purchase back the farms they once lost because of their former indifference to its value.

A deep sandy clay loam is best, but any loam soil that retains sufficient moisture through the summer months to make a healthy, vigorous, uniform growth will prove ideal for cane fruits if good culture is given.

While moisture is essential the soil should not be continuously so wet as to cause the roots to stand in water, and such lands should be drained. If conditions are such that the land cannot be drained and the water is not too near the surface, it will pay for a small patch of berries to mulch it heavily once a year.

The roots will grow near the surface of the soil and will get sufficient air and nourishment under the mulch.

Many soils have a close clay or gumbo texture, and where excessive moisture conditions exist it interferes seriously with cultivating, and will only permit of cultivating very late in spring.

The weeds grow rapidly in such very moist soils, and during spring and fall control the ground. Nature should take its course in such soils and a cover crop should be sown which will grow the best mulch, and in place of using a cultivator use a mowing machine, and grow the nourishment the plant needs at the foot of the plant, and thus control and utilize the growth instead of fighting it, as such soil can well support both crops.

The mowings could be placed in the rows to mulch the berry plants and smother any injurious growth about the crowns.



With such management these soils would give very high yields of the choicest of fruit instead, as at present, a sickly growth, the result of a struggle against the plow and cultivator, which cuts off the roots growing on the surface in such soils.

Soils that will grow both fruit and plant food at the same time is valuable when viewed from the proper standpoint.

A good mulch of thrashed straw is also very practicable.

Soils that do not retain sufficient moisture through July and August, to be controlled by a dust mulch, should if possible be mulched with some kind of organic matter or irrigated, or both.

As the culture of the cane fruits is a lucrative one under ordinary culture, then intensive culture should bring highly remunerative results. The general principles embodied in this treatise are sufficient to cover the points leading one to intensive practice.

The varieties are governed by climatic conditions. The European varieties are considered too tender to stand the extremes of temperature, and for successful culture the American varieties, being hardy, are used for commercial planting.

Many new varieties of American introduction have been planted, and in some localities prove successful, but the Cuthbert has been the main reliance where the raspberry succeeds to stand the extremes of climate, and when grown under proper conditions its hardiness, productiveness, shipping quality and flavor, combined as a whole, has not been equalled.

In a mild climate, as about Puget Sound, Washington, the Improved Superlative (of English origin) is an erect grower and bids fair to supersede the Cuthbert. The Superlative is very productive, berry large and season long. The Cuthbert and the Antwerp are the two varieties grown in this climate for commercial use.

The Antwerp has admirable qualities. It grows erect, causing its canes to mature early in the season, is moderately hardy and does not grow excessively tall. It fruits early and is very productive. The berries may be picked at an early stage of ripeness, slipped easily from the core without bruising, thus making it a fair shipper.

The Loudan is a promising variety and should be tested for commercial use as well as other introductions.

The European raspberries are considered of superior flavor to the American sorts, and as this fruit is at home in the climate of Puget Sound, where the industry is extensive, it offers a promising field there for much needed experimental work in securing varie-

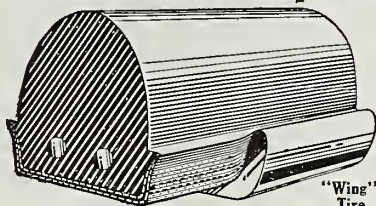
## PORTLAND WHOLESALE NURSERY COMPANY

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## Hood River Grown Nursery Stock for Season 1911-12

Standard Varieties  
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The sales of Goodyear "Wing" Carriage Tires increased 24% in 1910-11 over the previous season, though no more carriages were made.

The 1911-12 season will, we estimate, show the astounding increase of 81% over 1910-11.

148 of the 200 carriage builders in the U. S.—nearly 75%—are now using Goodyear "Wing" Tires.

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Nearly 4,000,000 Goodyear "Wing" Tires have been sold since their invention 13 years ago.

Just as Goodyear No-Rim-Cut Tires have become first in the automobile world, so have Goodyear "Wing" Tires become the sensation of carriage world.

In the light of these facts, would it not be folly for anyone to choose commonplace

carriage tires when "Goodyears" cost no more?

### Our "Wing" Tire

Note this patented "Wing." (See picture on posite.) How it presses against the channel, thus preventing mud, grit or water from getting in and quickly rusting the rim and destroying the tire base. This tire remains sound. It won't creep or get loose. Gives utmost wear. Will protect your carriage and greatly lengthen its life. Being of tough, springy rubber, it is exceptionally easy-riding. The

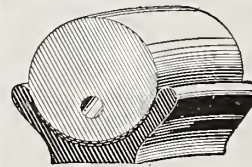
### Goodyear "Eccentric" Cushion Tire

is especially designed for lighter vehicles—runabouts, etc. Note the wire hole is below the center.

This increases the wearing depth of the tire one-half. Saves you that much money. This tire stays firm in the channel. The high-grade, resilient rubber used in the "Eccentric" makes it remarkably easy-riding. Always gives satisfaction.

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Send us your name on a postal today for our latest Carriage Tire Book and name of dealer in your town who sells Goodyear Tires. (533)

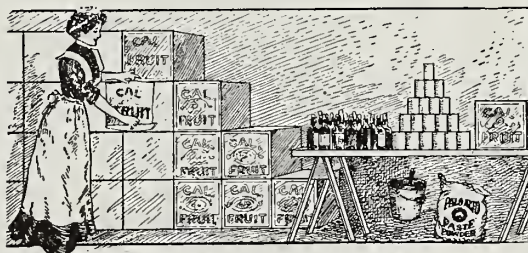


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We have earned a reputation for growing and marketing the cleanest and best stock planted in the West.

A card will bring you our surplus list, and prices that are just right.

*Have you ever tasted a Goodell Strawberry?  
If not, one more pleasure may be yours.*

*We grow the plants.*

**The Sunnyside Nursery Co.**  
SUNNYSIDE, WASHINGTON



ties, through hybridization, equal to the European sorts.

The ground should be plowed moderately deep and put in the best possible condition by frequent disking or harrowing, and when through, much will be gained by doing it over again, and the inspiration will come for this extra work from the results sure to follow such thorough preparation because plant food is liberated and thoroughly incorporated. The soil particles are made fine and aerated, and rootlets will waste no energy while seeking for plant food. The moisture will be conserved, the soil will be warmer, thus decomposing plant food, and the plant will find it a pleasure instead of an effort to grow.

Selection of plants is something seldom practiced by growers.

When ordering plants urge that strong suckers be sent and order one-fourth more plants than needed.

The size of the sucker and root is of importance, but the bud at its base more important.

Look for well developed buds of near uniform size at the base of the plant and discard all those not having any buds or small in size.

While the discarded ones are all good, selection is made to procure an even stand of strong canes, which is important, and the extra fruit will more than repay the cost of the entire bill of plants.

An even stand of strong canes means a proportionately large amount of strong buds at the base of the cane for the new growth the following season.

At all times use precaution to not expose the roots to the sun and air.

Order plants of the nearest nursery or grower and heel them in at once, covering the roots well with dirt, and if the soil should freeze then mulch with litter or dirt, and the soil will not lift to expose the roots while thawing.

## LILLY'S SEEDS

Lilly's Seeds are not an experiment—they are tested in our laboratory and trial grounds. They are specially adapted to the Pacific Northwest and are true to name. Our valuable catalogue will be sent free on request. Dealers sell Lilly's Seeds. If not, write.

The Chas. H. Lilly Co., Seattle

## Burpee's Seeds that Grow

140 VARIETIES ANY QUANTITY

Plenty of stock in our 40,000 pounds

Growing Plants as season requires

All makes high grade

Pruning Tools

Garden Tools

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International Stock and

Poultry Food

International Remedies

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Everything for Building

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Stewart Hardware & Furniture Co.

Hood River, Oregon

22,000 feet floor space

# Morse's

## GARDEN GUIDE

### for 1912

Our Guide this year is the fullest and most interesting we have ever issued.

**Melons** Our line of Melon Seeds never contained a more satisfactory lot of dependable varieties than this year. See pages 25, 26 and 29 of our 1912 Guide.

**Squash** In all Standard Summer and Winter varieties. If our catalogue does not tell you all you want to know write us.

**Pumpkins** Our stock is this year as complete as ever with anything wanted in pumpkins.

**C. C. MORSE & CO.**

128 Market St.

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## SEEDS

THE KIND YOU CAN'T KEEP IN THE GROUND

They grow, and are true to name  
Write for prices on your wants

188 Front Street **J. J. BUTZER** Portland, Oregon  
Poultry Supplies, Spray, Spray Materials, Fruit Trees, Etc.

Before planting, furrow out the rows straight to receive the plants, or plant by a wire.

When ready for planting distribute the plants in the row, about 24 in a pile, and cover the roots with soil.

Take a bundle in hand and start setting at the proper distance. The distance may be made accurate by using a long rope or wire and tie cord along it at intervals of the proper distance.

As each plant is set draw the fine, loose dirt from the furrow ridge with foot or a hoe with half a handle and tramp, using care not to interfere with the base bud or young shoots.

Do not set too deep, and when set draw loose dirt about the plant and enough to cover the bud. This loose dirt is to serve as a mulch.

If the soil is in good condition no tools will be needed for planting and planting rapidly accomplished, repaying one for thorough preparation.

After planting the furrows are leveled by cultivation.

At no time allow weeds to get ahead, but kill them right after germinating.

The ground may be occupied the first season between the rows by growing vegetable crops to pay for cultivating.

Use erect growing and dwarf varieties of vegetables, such as cabbage, onions, carrots, etc.

Plant in center between rows of berries, so as to cultivate on each side with horse tools.

The winter care of the berry patch consists chiefly in cutting out the old fruiting canes and fastening the new



# LATE TREE BUYERS

We still have in our fine cool storhouse, in splendid, dormant condition, a good assortment of many leading staple apple, peach, pear, etc. These we can pack and ship on a moment's notice to any point, with assurance to the purchaser that his trees will reach him in ample time for planting.

## APPLES

Baldwin	Northern Spy
Ben Davis	Ortley
Black Twig	R. I. Greening
Cox Orange	Rome Beauty
Pippin	Spitzenberg
Delaware Red	Snow
Delicious	Twenty Ounce
Gano	Vanderpool Red
Gravenstein	Wagener
Grimes Golden	Winesap
Jonathan	Stayman
King David	Winesap
King	Winter Banana
McIntosh	Yellow
Missouri Pippin	Transparent
Newtown Pippin	York Imperial
and many other varieties	

## CRAB APPLES

Hyslop	Whitney
	Transcendent

## PEARS

Bartlett	Flemish Beauty
Clapp's Favorite	Howell
Doy. Comice	Idaho
Duchess	Kieffers
d'Angouleme	P. Barry
Easter Beurre	Winter Nelis
Crocker	Bartlett

## CHERRY

Royal Ann	Black
Early	Republican
Richmond	Elton

## PLUMS

Abundance	Lombard
Bradshaw	Peach
Burbank	Satsuma
Green Gage	Weaver
Coe's Golden	Yellow Egg
Drop	

## PEACH

Carman	Hale's Early
Early Crawford	Late Crawford
Elberta	Salway
Fitzgerald	Triumph
Foster	Yellow St. John
and many others	

## APRICOTS

Moorpark	Hemskirk
Blenheim	Budd

In addition to the above we have a good many other varieties in all classes of fruit, berries, vines, shade and ornamental stock, ready for immediate shipment. Write us your wants and we will advise what we can or cannot do.

**WASHINGTON NURSERY COMPANY**  
Toppenish, Washington

canes in their place. It is a good practice to cut out the old canes immediately after fruiting and burn them, thus destroying any disease germs and insect pests they may contain. By cutting out the old canes immediately after fruiting, the new canes and leaves are exposed to more light and air, and as already explained, these are essential factors in developing leaf action for large axillary buds and maturity of the canes.

A troublesome insect in some localities is the raspberry cane maggot, but it is easily controlled when suckering the plants of the surplus shoots, as it is only the young, succulent growth that is chosen by the adult insect.

Pull out and burn the affected canes, which may be easily detected by the tips wilting, and upon investigation the insect may be found at or about the point below the wilting portion. (Get the experiment station bulletins on pests.)

The yield depends on conditions as already outlined and under ordinary good culture should amount to 450 crates (of 24 pounds each) per acre. This is the conservative allowance of one pound of berries to each can, with six canes in the hill and 1,794 hills to the acre, set at a distance of 3x8 feet.

Profits vary according to supply and demand with many products and would be with this fruit in small shipments uncontrolled by organized effort. The bulk of the raspberries raised in the Northwest are controlled by organized growers, who have created a demand for their superior berries beyond the supply.

Commercial transactions show that larger profits are always realized where a superior article is produced in large quantities and intelligently marketed.

This is proven in the history of the raspberry center of Puget Sound, Washington, where the average profits are being continually increased and the associations there received an average of \$1.50 per crate after deducting transportation and commission charges, the result of being able to ship in car lots.

The cost of harvesting the crop is as follows: Picking, 30 cents per crate; crates, 15 cents; commission to the association, 5 cents; total, 50 cents per crate, leaving \$1 for the grower or \$450 per acre.

Five acres is as much as one man can well attend and will furnish him steady and pleasant employment as long as the patch lasts, which under good culture should be fifteen to twenty years.

Lands near the main routes of railroads, especially those going East, are especially valuable for this industry, and farmers thus situated should avail themselves of this opportunity.

The principal difficulty with farmers, well situated for this culture, in localities where they are not familiar with its possibilities, is their timidity of planting a quantity and as to the successful shipping of this fruit to Eastern markets.

This timidity is strange procedure in the face of the facts of what is being accomplished and has been for the past twenty years.

Aside from being sold fresh, there is a great and increasing demand for evaporated and canned berries.

This is one of the few crops which (as proven by the berry organizations of the Northwest) is practically sold before it is raised (and money advanced to members at any time on the growing

# Kill the Scale

That Kills the Fruit

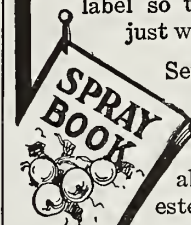
With the most concentrated solution of them all.

## LILLY'S

## LIME <sup>A</sup><sub>N</sub><sup>D</sup> SULPHUR

Pure, Strong and Free From Sediment

Every barrel or can TESTED and the strength stamped on the label so that the user knows just what to use.



Send for copy of Lilly's Spray Book and Price List, mailed free. It is a valuable book to all interested in fruit raising.

The Chas. H. Lilly Co., Seattle

## Get Catalog and Price List

420 acres devoted to nursery purposes

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# WOODBURN NURSERIES

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"ODERBRUCKER" AND  
"WISCONSIN NO. 9"

## For Introduction

We offer these new barleys in limited quantities at the **10c** PER very low price of..... LB. or \$8.00 per 100 lbs. Subject to stock being unsold.

## ORDER NOW ←

Barley is the coming grain crop for Northwestern farmers and stockmen

→ These two varieties are endorsed by the State Agricultural College as being the most profitable and heaviest yielding barleys.

## Portland Seed Co.

Portland - Oregon





crop), and a crop which, if emergency should occur, could be canned or made into jam and net as large returns as when sold fresh. A canning plant should always accompany large plantings.

Cane fruits are a sure crop every year, thus the profits may be depended upon for an indefinite time.

Its culture provides pleasant and remunerative employment at home during the picking season (vacation) for boys and girls as well as for the older members of the family, and it is doubtful if any other occupation can lay claim to the possibilities enumerated.

The culture and management of the erect growing blackberry is the same as given for the raspberry only that the plants and rows should be further apart and on rich soils, for field culture, should be 4x9 feet.

The Himalaya Giant, being a new introduction, the Evergreen blackberry will be discussed, as many growers are familiar with it and the general management of the one applies to the other.

The habit of the Evergreen dewberry vine is very trailing and is known to grow 50 feet long in one season, but the average length in good soil will be between 25 and 50 feet.

This trailing habit has caused cultivators much annoyance, and original ideas for controlling the canes are numerous, seldom finding two alike.

Trellises of various descriptions are used to support the canes, and the berry pickers have borne with patience the scratches and torn clothing received in their endeavor to gather berries growing in a confused mass of cane trained over cumbersome trellises and buildings.

The Evergreen berry differs from other berries in that it bears fruit on the old wood. This accounts for the many jungled masses found where the growers do not know the importance of cutting out the old canes, since they also bear fruit, and to the novice berries are all alike and of same value.

Because growing so long, the new canes of the current year are often cut back, which makes the many dormant axillary buds active, thus causing the buds to make many lateral shoots and adding all the more to the confused mass. Many of these grand berry plants have been grubbed out and destroyed because they became an uncontrollable mass.

Let us follow the habits of this plant and find how easily it may be controlled, and instead of a confused mass of laterals produced by cutting, we will just lead it as it would grow. (It oftentimes seems as if we try to teach the plant how to grow rather than let it teach us how it should grow.)

The natural habit of plants of this nature is to trail along the ground or over any obstacle in its way to afford it an opportunity to expand its leaves in the sunlight. On account of its vigor it grows erect several feet before bending under its weight to assume the trailing habit, and it is this point in its habit to take advantage of: then when it begins to drop of its weight to furnish it a support, not with trellis containing a lumber yard, but as is explained later under the improved culture. Trained in this manner, none of the auxiliary buds become active and no laterals are produced during the current year's growth, except where the check of the flow of sap occurs at the bend from the perpendicular to the horizontal position.

## VISIT THE OLD HOME

VIA



## O. S. L. and Union Pacific

Lines Protected by Automatic Block Signal

# Low Fares East

Round trip Summer Excursion tickets will be on sale on dates given below to more important destinations in the Middle Western and Eastern states.

Fares to some of the principal cities are quoted below. Proportionately reduced fares to many other points.

Baltimore . . . . .	\$107.50	New York . . . . .	\$108.50
Boston . . . . .	110.00	Omaha . . . . .	60.00
Buffalo . . . . .	91.50	Philadelphia . . . . .	108.50
Chicago . . . . .	72.50	Pittsburg . . . . .	91.50
Detroit . . . . .	82.50	St. Louis . . . . .	70.00
Denver . . . . .	55.00	St. Paul . . . . .	60.00
Kansas City . . . . .	60.00	Toronto . . . . .	91.50
Minneapolis . . . . .	60.00	Washington . . . . .	107.50
Montreal . . . . .	105.00	Winnipeg . . . . .	60.00

Return may be made through California at slightly higher fares. Going limit, 15 days; final return limit, October 31, 1912. LIBERAL STOPOVER PRIVILEGES permitted, and choice of routes.

### DATES OF SALE

APRIL 25, 26, 27, to St. Paul and Minneapolis only.

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JULY 2, 3, 6, 7, 11, 12, 15, 16, 20, 22, 23, 26, 29, 30, 31.

AUGUST 1, 2, 3, 6, 7, 12, 15, 16, 22, 23, 29, 30, 31.

SEPTEMBER 4, 5, 6, 7, 8, 11, 12, 30.

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10:00 A. M. "Oregon-Washington Limited."

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Both to Chicago via O-W. R. & N., O. S. L., U. P. and  
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### EQUIPMENT AND SERVICE STRICTLY HIGH CLASS

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Seattle, Washington    PORTLAND, OREGON    Tacoma, Washington



Where shoots are produced at this bend they should be gradually cut off, and finally as close as possible, for if they are cut off close all at once there would be a too sudden check to the flow of sap, thus having the tendency to awaken other axillary buds along the cane, which is the object to be avoided.

Shoots at this bend may be almost avoided if the bend is gradually made while directing the vine to the horizontal wire it is to occupy, thus avoiding any sudden check in the flow of sap.

It is understood that we are dealing with the plant of three years' growth. We have followed our plant in its current year's growth, and nothing is to be done now except to cut away the canes having fruited, which should not be cut until winter, for if done prior to this it would have the tendency to suddenly place too much vigor to the new cane, and it is of the utmost importance to keep the buds dormant until the next season.

The following spring, as the buds are swelling, cut back the cane of the now previous year's growth, perhaps one-third from terminal (conditions vary). This breaks the balance between the root and top and much vigor is placed in the remaining buds, which will be young laterals, resulting in making all of uniform vigor and length, which laterals, on a strong vine, should grow almost to the ground.

Contemplate a long row of the blackberries bearing fruit in one continuous mass from a wire five feet high to within a foot of the ground and on either side of the row, and the fruit most easily gathered.

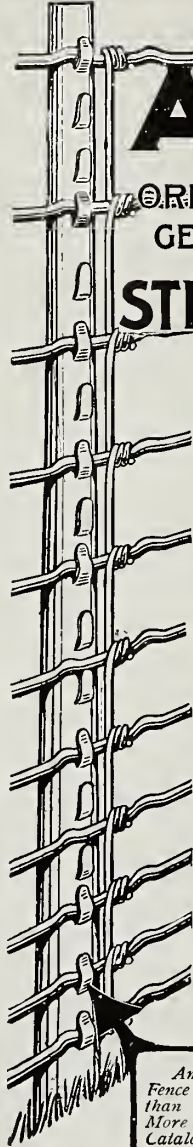
Comprehending this, one may see the possibilities of what can be produced on an acre. It must be understood that every hill produces, after the second year, four and six canes as described, the canes divided to each side of the hill. We are now to train the current year's growth, which is growing rapidly, and must be looked after. This is handled in the same manner, except that it runs along a wire above the fruiting canes, also running both ways from the hill, and when the fruiting ones have borne and have been cut out these new canes, when dormant, are lowered to the position the fruiting ones occupied, and the upper wire or trellis is thus left vacant for the new canes of next season's growth.

Growing in this manner, the new canes always have plenty of sunlight, which is absolutely necessary to produce a healthy, vigorous leaf; to produce the same in the bud at the axil, which must be depended upon for the coming laterals to produce the fruit.

Large leaves are essential to large fruit. This method is the simplest and handiest of any used at present and produces the best results.

Some growers are now losing greater possibilities because they train their new growing canes under the bearing canes, thus receiving little, if any, sun and light.

The possibilities of an acre of Evergreen or the Himalaya berry, to one not familiar, would be disputed. All things being equal, to produce the best results, the Evergreen blackberry will produce from six to eight hundred crates of berries per acre. A hill should yield between two and four crates, and some have been known to yield six crates. This berry (the Evergreen), being very



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firm, is a good shipper, and being the latest berry of the season generally commands good prices, especially for good fruit.

The Evergreen berry should not be picked till it becomes a glossy black, especially if for home consumption. Then it becomes very sweet.

The Evergreen dewberry, which is generally condemned on account of being all seed, when trained on this system and under good soil conditions, is transformed into a choice fruit, since it will contain plenty of pulp of high quality and the seed will appear no larger than in other blackberries.

Any berry with little pulp will cause the seeds to be the most prominent part of the berry. This system, with good culture, must result in the maximum yield of the highest quality fruit.

The Himalaya Giant is controlled in the same manner as the Evergreen. They will outyield the Evergreen, but will never supplant it, as they ripen their fruit much earlier.

The Himalaya bids fair to supplant all the erect growing varieties of blackberries, as it ripens its fruit about the same time as the Snyder and Kittatinny blackberry.

The erect growing varieties are hard to control as compared with this sys-

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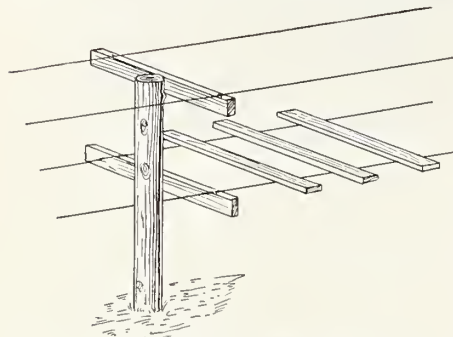
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tem of managing these vigorous plants. The erect growers yield less and the fruit is of no better quality. These mammoth vinous varieties must become the leading blackberries of the future, not only for field culture but also for gardens, as with this system of controlling the vines they may be trained against the walls of fences or buildings.

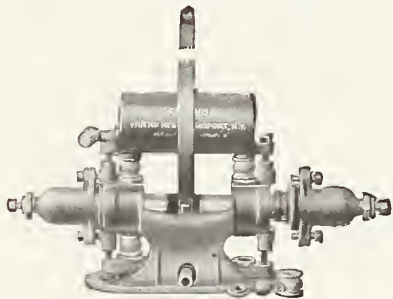


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Improved Culture and Training of Vinous Bramble Fruits.—This applies to such fruits as the (1) Phenomenal, (2) Logan raspberries, (3) Himalayas, (4) Evergreen, (5) Mammoth, (6) Primus, (7) Lucretia, and (8) Premo dewberries and blackberries.

On account of the trailing habit of these vines the plants are set at a

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"Friend" Fig. 15

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(Signed) Cragun Brothers.

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greater distance apart than for the erect growing brambles. The distance apart depends on the variety planted, other things being equal. The two former should be planted 8x16 feet; No. 3 should be 9x30 feet; No. 4, 8x24; Nos. 5, 6, 7 and 8, 7x14 feet.

The smaller of the above figures is the distance between the rows and the greater is the distance in the row. If more than one row is planted, avoid placing plants opposite each other between the rows, but at a point in the center between plants of opposite row.

Posts eight and a half feet long should be set two feet deep, where the vines are to be planted. These posts should average in thickness about five by five inches. Close by the posts the plants are set, so when the post is set prepare the ground about the post the same as for planting a small tree. For example, by digging a hole one foot deep and two wide and filling in with a good loaming top soil free of sod or grass roots. Firm the soil about the post four to six inches.

Plant the vine about eight inches from the post and to the south of it, and in row. Provide sufficient moisture

conditions throughout the growing season, but avoid having the soil too wet by lack of drainage.

As the shoots begin to develop train them up the south side of the post. The plants should be tied near the tip of the young vine about once a week with a cheap cotton twine, and at no time allow the tips to grow on an ineline until after they have reached the top of the post.

At this point of development the vines begin to need other support. For this purpose No. 9 wire is used to form a trellis and arranged on the following plan: The posts are six and one-half feet above the ground. At a point four and one-half feet from the base a cross piece two feet long and two by four inches should be securely nailed cross-wise to the row, not parallel with it, and another piece secured to the top of the post in like manner. These cross pieces are for supporting the wires from post to post.

The wires, four in all, are tightly strung and secured to the top and end of the cross pieces. Thus with this plan I devised, there are two wires above and two below. The top wires are used as cables upon which to train



the new growth each year and to afford the leaves on the new growth ample sunlight, which is very essential for the maturity of wood tissue and fruit production. After the new canes have reached the top of the posts, as formerly described, they are then trained to grow below the top wires. Cotton twine cut ten inches long is used as strands to support the vines to the wire cables. The vines should leave the top of the posts on a very easy curve to grow below the wires, as a sharp curve impedes the flow of sap and causes bad results in forming laterals below.

The ends of the vines should be watched carefully about once a week, and never allow them to grow in a downward position. The cotton strands should always be kept handy, and when the tips need supporting bring these strands below the tips of the vines and secure strings to wire cable. (The new canes each year should be divided so that half of them are trained on either side of the posts.) After the second year there will be sufficiently strong canes to allow of two canes to each wire and eight canes in all, or four canes or more on either side of the post. The two lower wires are for the support of the mature or fruiting canes. Thus there are two classes of canes to each plant—the newly growing and the mature ones. It is essential that both classes be kept separate. Before the plants are active in the spring the canes which have fruited should be cut out and burned. The lower wires are now free from the canes. The upper wires contain the new canes, and these, now mature, must be supported on the lower wire so that the upper wire may be free for the support of the next lot of newly growing canes.

To support the canes on the lower wires 1x1-inch strips are secured so as to lay on top of and at right angles with the wires, and should be set eighteen inches apart.

They should be long enough to extend one inch over the wire at either end and notched the exact width of wire with a saw, and make this notch one-half inch deep, which notch secures them to the wires and yet enables one to move or take these sticks off at will.

When ready to drop the new and mature canes to the lower wires the strands of twine supporting them are cut, beginning at the post, and the canes lower themselves and lie on the cross sticks supported on the lower wires. When lowered these new canes should be cut back about one-third of their growth.

Pruning back one-third breaks the balance between root and vine, so as to cause stronger and longer shoots of fruiting laterals. This aids in getting the laterals top heavy while growing and causes them to bend from their weight of fruit. As the berries on the tips of the shoots mature first, and are the largest, this aids the laterals to become top heavy and also eases the gathering of the fruit.

When ready to take out the old or dead canes the sticks are lifted off the wires, and with a little cutting of the vines the old canes drop to the ground and are readily cut out. Thus the entire system is, in a measure, automatic. While apparently there appear many details to this system of support, it is the simplest and the most feasible of any trellis system for these bramble fruits.

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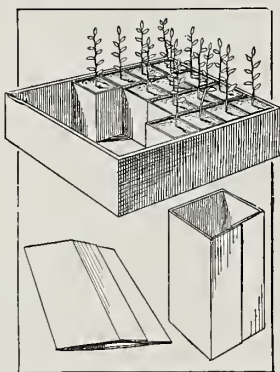
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Part of this system, to some, is not new, but the training of the vines up the posts and supporting the new canes below the upper wires by strands of twine is my introduction, and is a very important point in controlling the new canes so as to avoid mutilating them while manipulating the vine on the automatic principle.

It gives the leaves on the new canes more light, while sufficiently separating them. It may take a little more time to watch and tie the new canes properly, yet it is of the utmost importance to the intelligent culture of the vinous brambles and the best development of the new canes, and means much to the profits of this class of fruit. This system is a material saving of time at the season when it is necessary to lower the canes. This system is also feasible to train these brambles on the fence of the city lot and will add to the income by occupying a space otherwise vacant.

Where climatic conditions are such that the vines must be protected during the winter this system of training should be reversed and the upper two wires of the trellis dispensed with. The new vines should be trained to grow on the ground in the row, and kept in the row with sticks or wires eighteen inches long, and stuck into the ground at intervals where needed; or a better method would be to make arched wires as are used for croquet games.

The vines growing on the ground are easily covered with dirt or litter, or both. This not only protects the canes from frost but the buds also, if not uncovered too early in climates where late spring frosts injure the fruit buds.

As the new vines from each hill meet on the ground, do not let them interlace, but train so the vines from each hill are kept separate as they pass each other, either in opposition directions.

When the old canes have fruited cut out at once, so the new canes on the ground will have more light.

At the proper time in the spring the canes are easily lifted to the wires above, for easy gathering of fruit, and the ground free for the next lot of newly growing canes.

This plan is also feasible for the training of European grapes, where otherwise they could not be grown. The former system (two wires above and two below) is also ideal for training hardy grapes.

Should posts be scarce use heavy posts at end of row, well braced, below ground, and post inclining slightly back. A good brace is made by placing board below ground and in front of post. If row is long set, other posts at intervals of one hundred feet and a good stake at each hill to support wires from sagging with weight of fruit and also as a support for the upright training of the young vine.

[This article is published in book form and may be secured at all book stores and seed houses, or by addressing J. F. Littooy, Boise, Idaho. Price 40 cents.]

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Country Life in America..	\$4.00
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32 degrees," says Professor Lawrence. "As to whether it will germinate in a lower temperature I do not know." Professor Lawrence and Mr. Pratt will meet the growers of the valley here at the Commercial Club rooms next Saturday afternoon and explain to them the nature of the disease and how it may easily be prevented from causing rot to the apples. From the interest that has already been created by the discovery and what it will mean to the growers, a large crowd is expected. Visiting growers will be present, it is understood.

Anthraxnose has long been known to the orchardist and the horticulturist. It prevails to a great extent over Western Oregon and Washington, because of the great moisture in the atmosphere. In the Yakima and Wenatchee districts the growers are said not to be troubled with it to any great extent because of the arid condition of the country. It has been found that it is easily handled, and orchards that have been so badly infested with it that the owners were on the point of digging them up have been taken in charge by experts and have been entirely cured. "Less than a decade has passed, said Professor A. B. Cordley in the November, 1906, number of 'Better Fruit,' since those well versed in horticulture were predicting destruction of the apple growing industry of the humid portions of the Northwest by a disease which was known variously as 'canker,' 'dead spot' or 'black spot.' Nevertheless, in the last report of the Oregon State Board of Horticulture, President E. L. Smith and Commissioner Carson both expressed the firm conviction, based upon personal observation, that the disease can be perfectly controlled by spraying methods, as recommended by a certain bulletin of the Oregon Experiment Station."

It was at first thought that the anthracnose diseases that attacked cherry, apple and pear trees were of a different species. However, Professor Lawrence, who was at one time connected with the Washington Experi-

## Prof. Lawrence, Hood River, Discovers Rot Cause


THE discovery made by Professor W. H. Lawrence and B. B. Pratt of the pomological offices of the United States Department of Agriculture that the great portion of the decay of apples in storage is caused by the attack of the disease anthracnose is one of the most important events in the history of orcharding in the Northwest for a number of years. Professor Lawrence, the county fruit inspector, states that he has suspected that the rot was caused from anthracnose for a number of years. He began his investigations last year, and he and Mr. Pratt, who has been conducting a series of cold storage tests in Portland, have made the discovery that his suspicions were correct. Apples attacked by the species of rot have been tested and cultures made from them. They all display the same kind of spore in germinating that the

wounds of the anthracnose attacked tree reveals.

Several prominent orchardists were in Professor Lawrence's office last Thursday afternoon, when he demonstrated to them the results of his findings. All were enthused over his investigations and with the benefits it will mean to the Northwestern fruit districts where the disease (anthracnose) prevails. "The investigations which Mr. Lawrence and Mr. Pratt have been conducting, and the results of their work will mean the saving of hundreds of dollars to the growers," said E. H. Shepard, who was present at the demonstration, "for it will prevent a great portion of the premature decay of fruit in storage." Anthracnose thrives in a climate where there is an abundance of moisture and where the temperature is low. "The spores will germinate at a temperature of as low as

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mental Station, determined that they were the same diseases. In regard to orchards that had been seriously affected with anthracnose, Professor Cordley, in his article, quoting from the state society's bulletin, said: "Eisman Bros. owned an orchard of thirty-five acres near Grants Pass which, in 1901, was so badly diseased with anthracnose that they were about to dig it up. Every tree in this orchard was diseased with the fungus. Nearly all of the tops of the trees were either dead or dying. The vitality of the orchard was so low that it did not produce enough fruit to pay expenses. The brothers worked faithfully cutting out dead spots and dead wood during early spring months, but the fungus continued to increase. At my suggestion Eisman Bros. began spraying with bordeaux early in the fall, before the leaves were off the trees. The benefits of their first fall spraying were very pronounced. In two or three years the trees were vigorous and free from the fungus. It later produced a crop of apples which sold for \$35,000." Professor Lawrence recommends the fall spraying with bordeaux, but states that an early spring spraying, before the leaves come, will cover over the cankers caused by the fungus and prevent the spores of the disease coming out and being scattered to thus form new attacks. Proper spraying will soon relieve the orchard of the fungus on the trees, and having no place to germinate it will, of course, not be conveyed to the fruit and cause the destructive premature rotting.

In giving his early summary of the disease, Professor Cordley said: "The disease usually appears first in the fall upon one and two-year-old wood, soon after the autumn rains begin, as small circular, sometimes slightly depressed brown areas of the bark, which will continue to increase in number until the middle of winter, the larger number appearing during the months of November and December. During the trees' dormant period these diseased areas increase in size very slowly, although the fungus penetrates to the cambium, in which it may spread considerably beyond the area of the superficial canker, but with the advent of the warmer weather in spring, with its induced physiological activities, they may increase in size readily until under favorable conditions the disease may invade an area several inches in diameter by the latter part of May. At that time the increase in size of the canker spot and the energies of the fungus are thence devoted wholly to the production of spores. At that time the diseased areas are dark brown in color, markedly depressed and usually limited by ragged, irregular fissures which separate the dead from the surrounding living tissues. These dead spots vary in size from those not more than one-half an inch in diameter to extensive areas three or four inches wide by six or eight inches long. The spores, being small and light, are readily carried long distances by the wind, are



The National Insecticide Law requires that all Arsenate of Lead shall contain not less than 12½% Arsenic Oxide, not to exceed ¾ of 1% Water-Soluble Arsenic and not to exceed 50% of moisture. Beyond these chemical requirements the Law is not interested.

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washed about by the rains, and may also be carried by birds and insects." During the summer months the spores, which burst their way through the bark, are held in place by a gelatinous matter which the fall rains melt, and thus the spores are released at a time of the year when it is most conducive to their germination.—Glaier.

### An Appeal

The Montana Horticultural Society is supported by gratuitous memberships only. Annual membership fee is one dollar. Its founders were the pioneer fruitgrowers of the state. The society is responsible for the orchard interests of the state. Fruit growing is a strong factor in increasing the value of land. Nothing makes home more homelike than the orchard. Join the society and get the valuable information in the annual reports, or pay up dues, and you help grow the big red apple, and get the annual reports of the society and the reports of the state board of horticulture and a clear conscience in the fact that you have helped a good cause. Good fruit means good people—good people good homes, and good homes a great state. Join now. 1912 meeting at Great Falls, February 20, 21 and 22. Everybody invited. Send dues and membership to M. L. Dean, secretary-treasurer, Missoula, Montana.

### Red Raspberry Growing in Northern Colorado

By W. Paddock, Colorado Agricultural College, Fort Collins

**M**EN who make a living by growing small fruits are numerous in all sections where fruits thrive. But it is not often that we find men making a comfortable income by growing one variety of a certain kind of berry; yet this is being done in Northern Colorado. Five-acre tracts of Marlboro raspberries are not uncommon, and a plantation of this size keeps one man pretty constantly employed throughout the season. It is interesting to note that, at its home on the Hudson River, the Marlboro is a weak growing plant and much subject to an obscure disease. Although it was much planted at one time in New York, it is now being replaced by more vigorous varieties. But strange to say, under Colorado conditions and when planted on suitable soil, the plants are very vigorous, often growing ten feet in height. Not all soils are adapted to the raspberry; in fact it is nearly as peculiar in regard to soil adaptation as the potato. To secure the best results, soil for the raspberry plantation should be well drained and porous. In fact any land that will grow potatoes successfully is well adapted to raspberry culture. The plants are planted in rows six and seven feet apart and three feet apart in the rows. The culture is simple. The plants are laid down or buried during winter to protect them from frost and from drying winds. The covering is removed about April 20. This operation, together



This Exhibit won 3 first, 2 second, 1 third prizes—Note the 7 cups.

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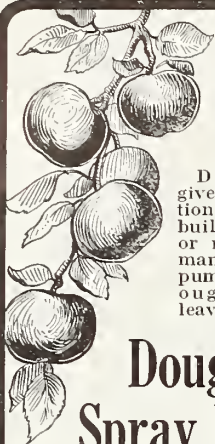
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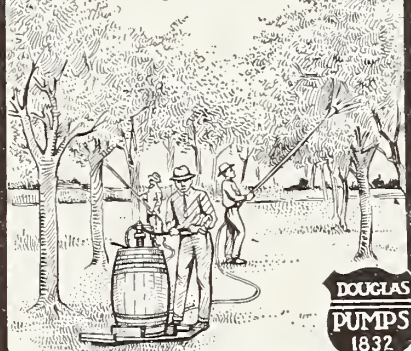
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with the leveling, constitutes the first cultivation. After this time the plantation is cultivated about three times at suitable intervals before the picking season begins. The plantation should be watered first about as the canes begin to bloom, then a second time just before the berries are ready to pick. Two light irrigations during the picking season may be necessary to keep the berries up in size. No more cultivation or irrigation is needed after this time, and if persisted in it ordinarily results in immature canes at the close of the season. An average yield for a good plantation in full bearing is 400 crates per acre. Five hundred crates is considered a large yield. The cost of producing has been estimated at forty-two cents a crate. Prices, of course, vary from year to year, but the returns to the grower have often exceeded a dollar a crate.

## Planting Garden Beans

J. W. Jung, in Des Moines Homestead

A GREAT many people seem to think that when land is too poor to raise anything else it may be planted to beans. This is a mistake, for beans, in order to produce a satisfactory crop, require a rich soil just as much as any other crop.

Beans will come into bearing a little earlier on sandy soil, but the pods will be of finer quality and borne in greater profusion on heavy soil.

Beans are very tender and should not be planted before the ground is quite warm and danger from frost is past. If the soil is not very fertile a liberal dressing of rotted manure should be applied and the ground deeply plowed. The ground may be plowed as early in the spring as the soil can be worked into fine, loose condition; you can then harrow or cultivate it several times before planting the beans, and thus kill most of the weeds that are sure to be in the ground. This will save much work later in the season, especially where beans are grown by the acre.

In the garden plant the beans in rows eighteen inches apart, either having the single plants every six inches or in hills about fifteen inches apart, as you can then hoe them more conveniently. For field culture the rows should be about thirty inches apart, so as to permit horse cultivation.

Give frequent shallow cultivations until the blossoms appear; after that cultivation should cease, as the flowers and young pods are very easily knocked off. It is useless to expect a good crop of beans from soil that has been so poorly prepared as to need deep cultivation after planting. Never work among your beans while the plants are wet from rain or dew, as it will cause them to rust and may ruin your whole crop.

Picking the pods as fast as they are large enough will greatly prolong the bearing season. Successional plantings should be made every two weeks until the middle of July to insure a constant supply of fresh, tender pods.

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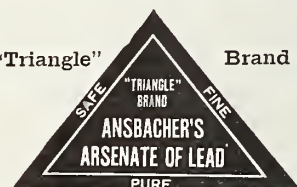
## Notice to the Public

The two leading magazines of the Pacific Coast, the Pacific Monthly and the Sunset, have been consolidated under the title of "Sunset—the Pacific Monthly." It is the intention of the publishers to spare no money or effort to make Sunset—the Pacific Monthly a credit to the West and a magazine of national value and importance. To introduce it to new readers, we will make the following special offer: Send 50 cents in stamps, and we will put your name on our subscription list for the next four months, and will send you free a copy of the superbly illustrated Midwinter number, and also the famous Sunset Indian poster, securely packed in a mailing tube. It will make a beautiful ornament for your front room or den. Send your order to Fred Lockley, Northwestern Manager, Sunset—the Pacific Monthly, Portland, Oregon.

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The Horticultural Department of the Ohio Experiment Station is desirous of obtaining the following numbers of "Better Fruit" to complete its files. Vol. 1, Nos. 1, 2, 3, 4, 5, 6 and 7 (July, 1906, to January, 1907, inclusive); Vol. 2, No. 7 (January, 1908); Vol. 3, No. 2 (August, 1908). Parties having the same for sale please address Horticultural Department Ohio Experiment Station, Wooster, Ohio.

**WANTED**—Young, hustling, experienced stenographer and bookkeeper for nursery office. Excellent opening for reliable person. Apply with references and full particulars as to age, experience and salary expected, to Richard McComb, general manager Fraser Valley Nurseries, Aldergrove, British Columbia.

#### A WARNING TO BUYERS

A number of flagrant examples of a too-prevalent abuse, recently called to our attention, prompts us to hold out the danger sign to our readers. This nuisance is an especially deplorable one because it works "in the dark," and in addition to perpetrating rank deception to the financial loss of the consumer, plies its trade in such a manner as to make it often difficult of detection. It should therefore receive the earnest attention of every consumer, not only for his own protection, but also for the maintenance of honorable business practices. We refer to the frauds which are practiced by infringers upon patent rights.

Every consumer is accustomed to the purchase of one or more standard patented articles of commerce. The patent, presumably, announces that the article is genuine—is exactly what the purchaser thinks it is to be through his previous experience with that article. Originally granted as a protection to the makers of a particular brand of goods having some peculiar merit or originality in manufacture, the stamping of goods as "patented," along with a trade-mark, has been of the greatest practical service to buyers in guiding them to the purchase of exactly the kind and quality of goods they desired. Thus consumers living in even the most remote regions have been able to purchase goods of certain standard patented varieties with absolute certainty of their genuineness, no matter how far away from the plant where the goods

were manufactured. When surrounded with the proper safeguards, therefore, the custom of patenting all kinds of worthy articles of commerce works to the great benefit and protection of the buyer. But with the abuse and flagrant disregard of patent rights there has arisen a species of deception which is the more to be deplored because it thrives upon the trust and faith of the public. Some infringers of patent rights have become so skillful in their nasty trade of imitation of standard patented merchandise that the innocent buyer can scarcely detect the spurious and fraudulent article. The result is that he pays for an inferior article the same price that he would pay for the original invention.

To cite one instance of this practice of deception that has recently come to our attention: Within the past year there has been placed on the market, we understand, a ready-roofing cleat which is a palpable imitation of the patented "Kant-leak Kleet"—a staple article for several years. It is reported to us that the imitation cleats are cleverly designed and exploited, so that the buyers are apt to be misled into purchasing them under the impression that they are the original kind. As might naturally be expected, it is also said that the patentee of this article intends to prosecute to the full extent of the law the alleged infringers on his patent rights. Every consumer who desires protection for himself and the square deal in business transactions cannot but wish for a successful outcome to this and all similar efforts by patentees to guard their products from fraudulent imitation. At any rate, we take this occasion to point the warning finger at this commercial abuse, and to advise our readers to do their buying with the utmost caution until the time shall come when such impostors are forever banished.\*



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The set is indispensable to all American libraries, not only because of its position as the foremost work of reference in its field, but by reason also of its great literary excellence and its scientific accuracy, as well as the wealth of cultural data and descriptions it contains. Nor has the scope of the volumes been confined to botanical subjects alone. Such captions as "Diseases of Plants," "Graftage," "Parks," "Perfumery Gardening," "Insects," "Nut Culture," "Railroad Gardening," "Transplanting," "Plant Breeding," "Storage," "Tillage," "Tools," all illustrate the fact that every subject in any way incident to the activities of the horticulturist has been fully covered, commercially as well as scientifically.

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It is therefore evident that the appeal of this work is very general. Its subject matter is of almost universal interest, and is treated in such a practical, scholarly and discriminating manner that whoever may be in any way concerned with horticulture, whether as a means of gaining a livelihood, as a mode of recreation, as an outlet for pent-up energy, as a field for scientific investigations, as a method of beautifying his surroundings, as gardener, seedsman, korist, student, teacher, botanist, merchant or country gentleman, will find in "The Cyclopedia of American Horticulture" a work replete with suggestions, abounding in ideas, and fertile in timely hints, philosophic in design, wide in scope and minute in detail—a counselor, guide and instructor ever within call.

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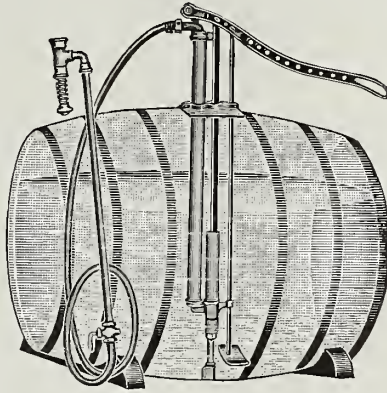
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**Jones, Post & Co., 601 Liberty Street, Kansas City, Mo.**

## Favors State Supervision of Irrigation Enterprises

From the Wenatchee (Washington) Republic

**T**WO great reforms which will be highly beneficial for the development of the Northwest in particular and the whole country in general are being championed by a great man who is the guest of Wenatchee at this time. George E. Barstow, president last year of the National Irrigation Congress, promoter of the 30,000-acre Pecos Valley irrigation project of Texas and of many other large projects, will be the principal speaker at the Commercial Club luncheon tomorrow. For several years he has been fostering sentiment from one end of the country to the other in favor of two big ideas. He would extend to the immigrant immediately after he arrives on the shores of America some of the privileges of the homesteader. He would also have established state commissions for the purpose of investigating all irrigation projects at the time of their inception

so as to prevent the fake promoter from imposing upon the small investor.

Barstow has just returned from the Methow Valley, where he investigated the merits of an 11,000-acre project which he would water from the Methow River. It is repulsive to him to make announcements about his plans until he has them thoroughly established, but he said to a representative of the Republic that he was highly pleased with what he saw in the upper country and the Wenatchee Valley, and has by no means abandoned the idea of making some very large investments in this section. He will continue his investigation with vigor and may have an important announcement to make in the near future. More than this he refused to say at the present time.

"The problem of what to do with the immigrant," said Barstow today, "is one of the most perplexing. Many of

these people possess a high order of thrift and of agricultural and horticultural knowledge. They would become important factors in the productive development of the country if given the opportunity. They have not the financial means to purchase outright a piece of land, hence they flock to the cities, and instead of becoming producers they are corrupted by idleness and evil associations, thus forming a cancer in the body politic. My idea would be for the government to extend a helping hand to these people by enabling them to locate on public lands, possibly not allowing them as large an acreage as a quarter section, but sufficient to acquire a competence, and give them an object to make this country their permanent home. The curse of the rapidly developing West, especially in the irrigation districts, is the unscrupulous promoter who attempts by questionable methods to bridge his lack of financial strength. Investors who are swindled and disappointed spread harmful reports, and the legitimate promoter and the new district suffer. If the states would establish commissions or enlarge the sphere of the present public service commission, to investigate every irrigation scheme when it is launched, weeding out the weak and the wicked, giving assurance to the public regarding the worthy, confidence would be restored and movement to the West would be accelerated."

Several of those who have heard these ideas expressed by Barstow are in hopes that he will enlarge upon them in his speech to the Commercial Club tomorrow. The local club has been contemplating for the last two years the appointment of a committee for the purpose of investigating all irrigation projects of this section, either giving each one approval or exposing its crookedness. It was suggested by John A. Gellatly today that the present would be an ideal time for the Wenatchee Commercial Club to adopt Barstow's idea and start an agitation for giving this work into the hands of the Public Service Commission. He would start an agitation and extend it to all parts of the state for the purpose of inducing the next legislature to pass a law giving these enlarged powers to the commission. Fred Graham, industrial agent of the Great Northern, was equally enthusiastic and declared that the movement would receive hearty support from railroad men.

To determine the value of different walnut stocks, the members of the Oregon Agricultural Experiment League are making an exhaustive investigation, upon which they will report to the secretary, Professor R. D. Hetzel of the Oregon Agricultural College extension division. Blanks are being sent out, on which the members will furnish information as to the kind of soil upon which their plantings were made, the elevation and other matters. The league requests that each person who starts this co-operative test secure three or four seedling trees each of the California black, American black and

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Embodies every convenience. Pump started and stopped from upper platform. Built on a platform of standard width so that it can be placed on any farm wagon. Also can be used as a portable pumping outfit or fire engine. Engine can be quickly removed and used to furnish power for any other purpose.

### 300 Lbs. Pressure at Nozzle with 8 Nozzles

Write at once for Bulletin No. 108, giving startling facts in regard to the profits to be derived from spraying, together with full and complete instructions, formula, spraying calendar, etc. (148)

### DETROIT ENGINE WORKS

Spraying Dept., Bulletin No. 108, Detroit, Mich., U. S. A.



Be sure to address your letter to our Spraying Specialist



English walnuts and grow these as seedlings without grafting to determine their adaptability to the conditions of that particular vicinity. If grafted or budded trees are not bought of the nurserymen to begin with, the league is suggesting to the members that an equal number of the American black and California black stocks be used in the test, and given identical treatment if possible. The information blanks will show, at the end of the test, the kind of stock used, age of nursery trees when bought or of seedlings when grafted, the date of grafting or budding, the percentage of grafts on each kind of stocks to grow, the average amount of growth made on each of the stocks during the first season, the age that the trees came into bearing and the comparative size and vigor of the trees at the bearing age. The mere list of names of owners of walnut orchards, with their addresses, will be valuable in accurately indicating the walnut growing districts of the state as thus far developed.

#### FRUITS RECOMMENDED FOR PLANTING IN EASTERN WASHINGTON

The following is the list of fruits recommended by the horticulturist of the State Agricultural Experiment Station at Pullman for planting in that part of the state lying east of the Cascade Mountains. In cases where the varieties to be recommended for planting in the irrigated valleys are different from those best adapted to the non-irrigated uplands this is indicated. The letters (E), (M) and (L) indicate that the varieties ripen early, mid-season, or late, respectively. The lists do not include all varieties that might be planted, but are those which experiments and actual orchard practice have shown to be desirable for general planting. The varieties are arranged alphabetically in each case:

**Apples**—(For the irrigated valleys) Delicious (L), Duchess (M), Gravenstein (M), Grimes Golden (L), Jonathan (L), King (M), Rome Beauty (L), Spitzenberg (L), White Winter Pearmain (L), Winesap (L), Winter Banana (L), Yellow Newtown (L), Yellow Transparent (E); (for upland) Delicious (L), Duchess (M), Gano (L), Gravenstein (M), Jonathan (L), King (M), Rome Beauty (L), Wagener (L), Wealthy (M), White Winter Pearmain (L), Winter Banana (L), Yellow Transparent (E), York Imperial (L).

**Pears**—Anjou (M), Bartlett (E), Clairgeau (L), Comice (M), Flemish (M), White Doyenne (M), Winter Nelis (L), Seckle (M).

**Sweet Cherries**—(For irrigated valleys) Bing (M), Black Republican (L), Hoskins (L), Lambert (L); (for upland orchards) Bing (M), Centennial (M), Hoskins (L), Lambert (L), Vilne Sweet.

**Sour Cherries and Dukes**—Early Richmond (E), Montmorency (M), Northwest (L), Olivet (M), May Duke, Late Duke, Reine Hortense.

**Peaches**—(For irrigated valleys) Early Crawford (E), Elberta (M), Foster (M), Hale (E), Hills Chili (M), Late Crawford (L), Salway (L), Wheatland (M); (for upland orchards) Alexander (E), Champion (E), Early Crawford (E), Hale (E), Triumph (E), Wonderful (M), Foster (E).

**Apricots**—(For irrigated valleys) Early Golden (E), Hemishirke (M), Moorpark (E), Royal Ann (M); (for upland orchards) Gibb (E) and Moorpark (E).

**Plums**—Abundance, Bradshaw, Peach and Wickson.

**Prunes**—Hungarian, Italian and Silver.

#### Editor Better Fruit:

The writer wishes to improve this opportunity of expressing his admiration and appreciation of your paper, which publication is, without question, the best, the cleanest and most useful publication of its kind. It shows a thorough and personal knowledge of the fruit industry, and is of great importance and use to all engaged in fruit growing who are wise enough to number themselves among your subscribers. Very truly yours, C. E. Gudebrod, president Turkey Knob Orchard, Mount Jackson, Virginia.

## P-W-R ARSENATE OF LEAD P-W-R

SUPPLIED BY DEALERS THROUGHOUT THE UNITED STATES

**POWERS-WEIGHTMAN-ROSENGARTEN CO.**

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## TO DESTROY APHIS, THRIPS, ETC. Without Injury to Foliage

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# "Black Leaf 40"

SULPHATE OF NICOTINE

"Black Leaf 40" is highly recommended by experiment stations and spraying experts throughout the entire United States.

Owing to the large dilution, neither foliage nor fruit is stained.

Also, "Black Leaf 40" is perfectly soluble in water—no clogging of nozzles.

#### PRICES:

10½-lb. can, \$12.50—Makes 1000 gallons, "5/100 of 1 per cent Nicotine"

2½-lb. can, 3.25—Makes 240 gallons, "5/100 of 1 per cent Nicotine"

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These prices prevail at ALL agencies in railroad towns throughout the United States. If you cannot thus obtain "Black Leaf 40," send us postoffice money order and we will ship you by express, prepaid.

## The Kentucky Tobacco Product Company

INCORPORATED

LOUISVILLE, KENTUCKY

PORTLAND SEED CO., General Agents

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## Bean Spray Arsenate of Lead (In Steel Containers)

Why buy Arsenate of Lead in leaky wooden kegs when you can buy it in airtight steel containers? Every container is full weight, too. We guarantee not less than 15% arsenic oxide and not more than 50% moisture. On account of the fine physical condition of Bean Spray Arsenate of Lead you can work it up ready for use in the can. It is not necessary to "add water slowly while rubbing to a thin paste," which is necessary with other lead arsenates. When the container is empty use it for an orchard heater.

The Government has used this arsenate exclusively for three years. GET OUR SPECIAL LOW PRICES. Ready for immediate shipment.

## BEAN SPRAY PUMP CO.

213 WEST JULIAN STREET, SAN JOSE, CALIFORNIA

Stock also carried in Portland



## FRUIT TREES FOR SALE CHEAP

# Winesap, Rome Beauty, Jonathan, Delicious, Yellow Newtown, King David

By the Thousand

Freight Prepaid

Address **The Tim Kelly Nurseries, Wapato, Washington**

## Back to the Farm Remedy for Ills

From the New York Sunday Herald

**M**ANY means toward bringing about a change in conditions which to those in moderate circumstances has become almost intolerable has been devised by Mr. William C. Brown, president of the New York Central & Hudson River Railroad Company. He is the author of that oft-heard slogan, "Back to the Farm," and, furthermore, he practices what he preaches, inasmuch as the campaign launched for the repopulation of the deserted farms throughout the state has brought forth splendid results. Families are coming to the Empire State from the Far West and other points daily, and, better still, none come empty handed. All have bought acreage and already they are reaping the harvest they were led to believe awaited them here. Mr. Brown had this to say: "When the true and ideal philanthropist awakens to the crisis which affairs in this country are rapidly

approaching, and he donates a fund for the benefit of worthy and industrious young men and women who desire to study scientific farming, and later is willing to advance them money from this fund with which to pursue agricultural careers, then perhaps results may follow which will tend to lower the present high cost of living. But until the present acreage now under cultivation is doubled and farmed on a more intelligent and scientific basis we need look for no relief. Such philanthropy as this would be more far reaching than that which we have had brought prominently to our attention in the immediate past, for it would be so universally beneficial that it would prove a veritable boon to long suffering humanity. The attention of the people of all nations, for the last four or five years, has been sharply directed to the question of increased cost of living, and various reasons have been given for this increased cost. There is no question that the large production of gold, which is simply a measure of value for all commodities for which it is exchanged, has had an appreciable effect in this direction. It is also true that people live on a more expensive scale than formerly, but overshadowing these causes is the fact that the things which are not luxuries, but absolute necessities used by all people, whether rich or poor, have increased in very much greater ratio than other commodities.

"For example, the Bureau of Statistics at Washington, in a recent report, states that in the ten years next preceding the date of the report all commodities, including agricultural products, have increased 23 per cent; but separating the products of the farm from all other commodities, the increase in price of these products, on an average, amounts to 87 per cent. Another set of figures throws a powerful sidelight on this question of the high cost of living. During the last ten years the acreage devoted to agriculture has increased 23 per cent and agricultural products have increased 36 per cent, but consumption during the same period has increased

60 per cent, showing an increase almost three times as great as the increased acreage and almost twice as great as increased production. In addition to this great increase in the farm price of agricultural products our wasteful uneconomic system of distribution from the producer to the consumer has added a very large arbitrary charge in addition to the increase received by the producer. Very frequently this great difference is sought to be explained on the ground of high freight rates, and it may be of interest to know just what relation this sort of transportation bears to the price at which the product



### COULD YOU USE A GOOD SPRAYING CALENDAR?

We have just had a small circular printed which contains valuable information on when to spray, what to use, what to spray for, etc., as recommended by the Washington Experiment Station at Pullman, Washington. If you grow nothing more than a few berries in the back yard, you need this bulletin. Just drop up a card, and a copy will be mailed you free.

If you are in the market for anything in the nursery line, and want good, clean, thrifty, guaranteed stock, just mention it to us, and we will be glad to go into the matter with you. We have the finest block of all the staple varieties to be found in the West.

**TOPPENISH NURSERY COMPANY**  
TOPPENISH, WASHINGTON

*Located in the heart of the  
famous Yakima Valley*

We need a few more live hustlers to represent us in good territory. Let us explain our proposition.

"Northwest"  
trees  
are best

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trees  
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We have for the coming season a  
complete line of

### NURSERY STOCK

Including everything handled in  
the nursery line

Write for our new prices and  
catalog

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North Yakima, Washington

AGENTS WANTED

## THE OLD RELIABLE Albany Nurseries

Received highest award for display of apple trees at the big California Apple Show at Watonsville.

The above speaks for us.

For good grade of nursery stock and right prices address

**The Albany Nurseries**  
(INCORPORATED)  
**ALBANY, OREGON**

Salesmen wanted. Easy to sell  
our trees.



is sold. The New York state farmer is receiving an average of about 90 cents per bushel for potatoes which are retailing in small quantities in New York city at the rate of \$2.80 per bushel. The freight rate from Central New York, a distance of about 300 miles from New York city, is 8.4 cents per bushel; that is, out of a difference of \$1.90 per bushel between the price received by the producer and the price paid by the consumer, the cost of transportation amounts to 8.4 cents. Investigations of the Department of Agriculture show that the average price paid to producers of butter in the United States on January 1, 1912, was 28.1 cents per pound, while the retailing price in New York city and vicinity was from 45 to 60 cents per pound. The difference per pound between the price received by the producer and the price paid by the consumer was from 17 to 32 cents, while the freight rate on a pound of butter from points as far west as the central part of the State of Iowa, a distance of more than 1,200 miles, is less than one cent per pound.

"Coincident with a retailing price in New York of from 50 to 60 cents per dozen for eggs, the producer in the Middle West was receiving, on an average, about 30 cents a dozen. Of this difference the freight rate represents one and one-half cents a dozen for handling this perishable commodity in refrigerator cars a distance of more than 1,000 miles, the railroad assuming all the risk of damage by breakage and delay. With a difference of from five to eight cents a quart between the price paid the producer of milk and the price charged the consumer in New York city, the freight rate for a distance of from 300 to 400 miles, including icing in transit in order to meet the standards insisted upon by the health department, the railroad receives eight-tenths of a cent a quart. I do not think either the commission house or the retail concern in the city exacts an exorbitant profit. I do think, however, that there are too many small stores, and the waste of carrying many duplicate stocks in multiplied stores, the disad-

## ABOUT PLANTING TREES

When you are sick do you employ an inexperienced physician, or when in business troubles an attorney who has just been admitted to the bar? Then why, when the important step of planting a commercial orchard is contemplated, should you not use the same discretion and insist on getting trees that are grown right, propagated from trees that have proven their value and annually bear large crops of select prize-winning fruit?

The planting of an orchard is an epoch in your career, and before undertaking the work it is a good thing to make a careful investigation into the relative merits of the trees you intend to plant. Be sure that they are propagated from trees that are early, abundant and regular bearers of fancy fruit.

The mistake of an attorney may be corrected by court, those of the physician can be buried, but those of an orchard stand as lasting monuments of folly and reproach. THE CHARACTERISTICS OF THE PARENT TREE APPEAR AGAIN IN THE YOUNG TREE AND ITS FRUIT. In selecting the trees for your orchard choose those that have the money-making features and thereby assure certainty of results.

Our Northern Grown Nursery Stock is propagated from trees that are early and prolific bearers of fancy fruit. Buy our pedigreed stock and get results.

**THE NORTHERN NURSERIES**

Box 418 CHEWELAH, WASHINGTON

# CREATION



The tone is the Jewel.  
The case is the Setting.  
The combination is the  
Steinway—the Perfect  
Piano.

**H**E who is blessed with the power to create is blessed with God's greatest gift to man, and if he uses that power to increase the happiness of his fellow men he becomes a benefactor to the human race.

The world owes homage to the men who have devoted their burning energies to the consummation of one purpose, to the final and most perfect development of an ideal.

## THE STEINWAY PIANO

Is an example of the grand result of years of persistent, purposeful striving after the very highest musical ideal. Sons have taken up the task where fathers left off, so that alternate generations of genius, working through the finest piano factory in the world, have evolved the Steinway—a piano that has long since been acknowledged the musical masterpiece of the ages.

Priced at \$575, \$625, \$775 and up to \$1,600. Of course you can buy a piano cheaper, but it will be a cheaper piano.

Why not get the best?

VICTOR TALKING  
MACHINES and  
SHEET MUSIC

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there is any nursery, East or West, that enjoys a better reputation than ours for furnishing good, clean, healthy stock. We are willing to match our stock and service against any nursery in the world. For several years we have been supplying most of the trees planted in the famous Wenatchee Valley, and the tens of thousands of growing trees, furnished by us, speak louder than words.

We have a large and complete line of fruit and shade trees, ornamental shrubs, vines, roses, etc.

Our Customers Get What They Order

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Wenatchee, Washington

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### Strong One-Year-Tops on Three-Year-Roots

selected from best Hood River bearing trees

We offer the varieties that made Hood River famous

SPITZENBERG

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**TREE TANGLEFOOT** A harmless, sticky substance applied directly to tree trunks. Remains effective rain or shine three months and longer fully exposed to weather. One pound makes about nine lineal feet of band. No apparatus required; easily applied with wooden paddle. Especially recommended against canker worms, climbing cut worms, bag worms, and gypsy, brown-tail and tussock moth caterpillars, but equally effective against any climbing pest. TREE TANGLEFOOT needs no mixing, but is always ready for use. Do not wait until you see the insects. Band your trees early.

Price: 1-lb. cans 30c, 3-lb. cans 85c, 10-lb. cans \$2.65, 20-lb. cans \$4.80  
For Sale by all Reliable Seed Houses

**THE O. & W. THUM COMPANY, Grand Rapids, Michigan**  
Manufacturers of Tanglefoot Fly Paper and Tree Tanglefoot Send for Booklet

## PORTLAND SEED CO., Portland, Oregon

Exclusive Agents for Oregon and Washington. Write for Catalog and Prices

**YOUR INCOME** depends upon the kind of nursery stock you get. If you are willing to pay a fair price you will get good trees. **YOU CAN'T GET SOMETHING FOR NOTHING.** If you expect to pay next-to-nothing and get good, first-class stock, you are mistaken, that's all. You can't produce a high quality tree for little or nothing any more than you can an axe, wagon, or any implement.

**YOU ARE THE LOSER** if you let the question of price alone influence your judgment when buying. Your loss is not temporary, but extends over a long period of years, or as long as your orchard stands. The folly of buying cheap stock will be impressed upon you each year as you figure your returns. Better be on the safe side and buy where you are sure of getting just what you want.

Our sales this year could not have so largely surpassed last year's had we not made good in the past.

Catalog free.

**Yakima Valley Nursery Company**

More Salesmen Wanted

Toppenish, Washington



## Nursery Catalog NEW, HANDSOME, INSTRUCTIVE, UP-TO-DATE

Describing Fruit and Ornamental Trees, Shrubs, Vines, Roses, Berry Plants, etc.

Free on request. Write now, mentioning this paper

**J. B. PILKINGTON, NURSERYMAN, PORTLAND, OREGON**

## Chico Nursery Company

GROWERS OF

High Class Nursery Stock

The best that good soil, care, skill and long experience can produce  
Write us for prices on Grape Vines, Cherries, Apples, Peaches, Pears, Nut Trees, Ornamental Shade Trees, Flowering Shrubs and Roses  
Peach Seed for sale Catalogue free

**CHICO NURSERY COMPANY, Chico, California**

vantage of buying in small quantities, the wages of multiplied clerks and multiplied cost of delivery, make necessary a price much larger than the consumer would be called upon to pay if the methods of distribution could in some way be put on a more economic basis. I am convinced from a careful observation that in a general way our method of distribution from the producer to the consumer is one of wasteful extravagance, not the fault of the men engaged in it so much as the weakness and extravagance of the system itself. The things referred to, however—the increased production of gold, the higher basis of living and the uneconomic methods of distribution from the producer to the consumer—are almost negligible quantities as compared with the fundamental trouble, which is the alarming rapidity with which consumption of the products of the farm is overtaking production. In ten years, from 1899 to 1909, with an increase in area cultivated of nearly 3,500,000 acres, the average price per bushel of corn has increased 80 per cent. The area devoted to wheat in 1909 as compared with that of 1899 shows a reduction of about 8,000,000 acres, but an increase in production of nearly 25,000,000 bushels, and an increase in value of 77.8 per cent. With an increase of more than 10,000,000 acres of hay and forage crops and an increased production of nearly 18,000,000 tons, there is an increase in value of 70 per cent.

"With an increase in the number of horses owned in the United States in 1909 over 1899 of nearly 1,500,000, and notwithstanding the hundreds of thousands of automobiles which have come into use there is an increase in the value of these horses of \$1,180,000,000, or more than 131 per cent. Just think what a boon automobiles have proved to be after all! With an increase of 919,000 mules, the comparison covering the same respective periods, there is an increase in value of \$326,000,000, or 166 per cent. The census report shows the following figures applicable to poultry, including turkeys, chickens, ducks and geese: In 1900 the number was 250,623,000; in 1910, 291,365,000, an increase of nearly 41,000,000, or 16.2 per cent, while the value increased nearly \$68,000,000, or practically 80 per cent. Wheat is the most important food

A Reputation to Sustain

## Vineland Nurseries Company

Clarkston, Washington

PROPAGATORS OF

Reliable Nursery Stock


All stock budded from bearing trees, fruit and ornamental



staple of the white man, and New York state, with a population of something over 9,000,000, consuming per capita about 5.4 bushels per annum, requires approximately 50,000,000 bushels of wheat each year to feed the people living within its borders. The farmers of the state produce on an average only 7,000,000 bushels a year, leaving a deficiency of 43,000,000 bushels each year, which must be made up by drawing upon the surplus of other states. In 1910 only eighteen of the forty-eight states produced sufficient wheat for their own consumption, and with the rapid increase in population, unless an increase in production per acre can be brought about, it is only a question of a short time when the United States will become a large wheat and flour importing rather than an exporting nation. Potatoes, like wheat, are a food staple of almost every American family, and the empire of Germany, with a total area less than the State of Texas, produces annually more than seven times the number of bushels of potatoes that are produced in all of the states of the Union combined. The only hope for checking the rising prices of farm products is a vigorous, earnest, persevering campaign for better methods of seed selection, fertilization and cultivation. While present prices are high as compared with the abnormally low prices which obtained for more than thirty years after the close of the civil war, these prices are not unreasonably high. They do not, in my opinion, afford the producer more than a moderate margin of profit, and I do not believe we shall ever see any material recession in them.

"The utmost that can be hoped for is to maintain a level of prices for farm products somewhere near the present basis and prevent a further advance in the cost of living to a level which will mean great suffering for many and danger for all. This can only be accomplished by a continuous increase in the product per acre of the nation's farms, which must be brought about by a campaign for better agricultural methods such as I have above suggested." Mr. Brown, while admitting that the Agricultural Bureau at Washington has rendered the farmer great aid, and that it has done and is doing splendid work, said that its field is limited, for the territory is too wide for any one institution to cover. "The hope of our country," he continued, "lies in our agricultural colleges. Such institutions as the agricultural colleges of Illinois, Wisconsin, Iowa and that at Cornell have done wonderful work, and each year they are equipping young men and women for the task of taking hold of land long since worked to death and rejuvenating it, and reaping from it big and marketable crops. That is what we must look forward to. Our cities are overcrowded now, and each year they are becoming more so. The country boy, tiring of the quiet of his surroundings, longs for the bright lights and hustle and bustle of the big city. He comes to town eager and will-

## PLANT TREES WITH



# DU PONT

## Red Cross Dynamite


**Stops First Year Losses.**

**Speeds Up Development**

**One to Two Years.**

**Improves Quantity,**

**Color and Quality of Fruit.**



The illustrations herewith are correct reproductions of photos of two-year old Bing Cherry trees planted same day out of same shipment. Similar results have been obtained all over the country. The root diagrams show the reason. You can't afford to plant trees in spaded holes.

### Write for Free Booklet

To learn how progressive farmers are using dynamite for removing stumps and boulders, planting and cultivating fruit trees, regenerating barren soil, ditching, draining, excavating and road-making, ask for "Tree Planting Booklet, No 338"

## DU PONT POWDER CO.

Pioneer Powder Makers of America WILMINGTON, DEL.

WE HAVE ONLY A FEW THOUSAND OF THOSE

## Yellow Newtown, Spitzenberg, Ortley, Arkansas Black and Winter Banana


that you saw a photo of in the October and November issues. We have some small lots of other leading varieties, as well as pears, cherries and peaches.

Bear in mind that these trees were all grown on well drained virgin soil, on No. 1 whole roots, all buds selected from the best bearing trees in Hood River, and we guarantee every tree true-to-name. You can save agent's profit if you buy direct from us.

Write at once for prices, before it's too late. Address


## TRUE-TO-NAME NURSERY

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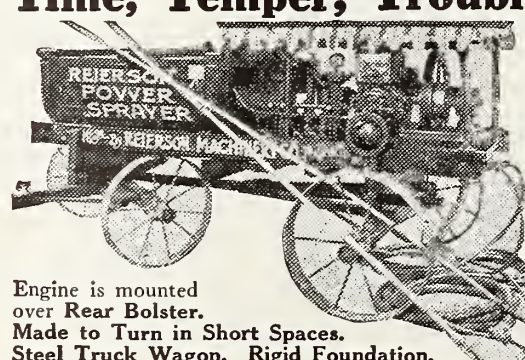
### RHUBARB FOR PROFIT

\$1,000 profit per acre. NOW IS THE TIME TO PLANT BOTH THE BERRY AND RHUBARB. BERRY PLANTS OF ALL SORTS. WRITE FOR FREE BOOK TODAY. J. B. Wagner, Pasadena, California, "Rhubarb and Berry Specialist."



A Free Book on Rhubarb Culture

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Engine is mounted over Rear Bolster. Made to Turn in Short Spaces. Steel Truck Wagon. Rigid Foundation.

Won the blue ribbon, highest award, over all competitors at the Salem State Fair in 1911. Equipped with 2½ H. P. 4-cycle Waterloo Boy Gas Engine. Special latest triplex spray pump. Easy get-at-able to all parts.

### Lightest, Most Compact

Guaranteed to Be the Best Built throughout of Special Machinery adapted for spray pumps. Will stand up perfectly under 250 pounds steady pressure. For small orchards we recommend our "Pippin" Duplex Power Sprayer—guaranteed to maintain a 225 pound pressure—at \$150.00. Write for catalog S 4

## REIERSEN MACHINERY CO.,

182-4-6 Morrison Street  
PORTLAND, OREGON



LESLIE BUTLER, President  
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Established 1900

## Butler Banking Company

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Capital fully paid - - - \$100,000

INTEREST PAID ON TIME DEPOSITS

We give special attention to Good Farm Loans

If you have money to loan we will find you good real estate security, or if you want to borrow we can place your application in good hands, and we make no charge for this service.

THE OLDEST BANK IN HOOD RIVER VALLEY

## New Residents

We are always pleased to extend courteous assistance to new residents of Hood River and the Hood River Valley by advising them regarding any local conditions within our knowledge, and we afford every convenience for the transaction of their financial matters. New accounts are respectfully and cordially invited, and we guarantee satisfaction. Savings department in connection.

**Hood River Banking and Trust Company**  
HOOD RIVER, OREGON

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Oldest bank on the Pacific Coast

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Surplus and undivided profits - - - 800,000

Officers:

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R. S. Howard, Jr., Assistant Cashier  
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INTEREST PAID ON TIME DEPOSITS AND SAVINGS ACCOUNTS

Accounts of banks, firms, corporations and individuals solicited. Travelers' checks for sale, and drafts issued available in all countries of Europe.

**FRUIT** Western Soft Pine  
Light, Strong and  
Durable

"Better Fruit" subscribers demand the "BETTER BOX" **BOXES**

TWO CARLOADS DAILY

DISTRIBUTORS FOR

## Save Time Hallocks

The best, most satisfactory folding berry box on the market. Get our prices on the Hallocks and crates complete to your station.

### Washington Mill Co.

Wholesale Manufacturers  
Spokane, Washington

ing to do anything that will insure him board and lodging. Not only has he taken the place that rightfully belongs to the city boy, but he has left a vacancy in the farm force which no city boy could at once fill, even though he had the chance. Every year, I am glad to say, the classes in the agricultural colleges are fuller, and each year the scope of the work is broadened, and when graduating day comes a splendid corps of men and women go forth to scientifically treat old and worn out soil, and under their experienced hands give it life and a producing power far beyond the fondest dreams of the farmer of the old school. I pin my faith to the farmer. That is, the farmer who really and scientifically farms. When he comes into his own city dwellers will reap the benefit as well as the tiller of the soil."

Mr. Brown believes that there are too many groceries by thousands in New York city. He thinks the consumer would fare better if the number was greatly reduced. "We have something like thirteen thousand groceries in the Greater City," Mr. Brown went on to say. "I believe with three

thousand our entire population could be comfortably and simply served, and the cost to the consumer would be reduced. It is this fierce competition among the little shopkeepers which keeps the prices of commodities up instead of lowering them. This may sound paradoxical, but it is true. Each of these little shopkeepers has all the expenses incidental to maintaining a store, and add to this the great cost of delivery, you can see that if there were fewer, and those who continued in business could conduct their establishments on a larger scale, it would tend to lower the prices of all the table necessities they handled. Another thing we mustn't lose sight of is the tremendously rapid pace at which we are living these days. We are not satisfied with the simple but wholesome comforts, pleasures and luxuries that were good enough for our forefathers. We seek pleasures that cost us heavily. Our clothing, boots, shoes, in fact everything we wear costs far more today than they did a good many years ago. Yet good clothes can be purchased today just as cheaply as then, that is, if we would be content to wear them. But nowadays we must patronize a fashionable tailor. Women want gowns made by fashionable modistes, who want fashionable prices, which, in reality, means exorbitant profits. Our recreations are taken without any regard to the cost. And this applies to the man of moderate means as well as to those of wealth. It is that ever

# The First National Bank

Hood River, Oregon

F. S. STANLEY, President  
J. W. HINRICHES, Vice President  
E. O. BLANCHARD, Cashier  
V. C. BROCK, Assistant Cashier

Savings Department  
Safety Deposit Boxes

Capital and Surplus, \$127,000  
Total Assets over \$600,000



prevalent desire to emulate the rich that invariably brings want and suffering upon those who are not content to live within their means, or to go slow at first, with the firm intention of laying something aside before they recklessly plunge into the vortex of gayeties, which not only saps their vitality but their earnings, too. We are too prone to seek the artificial things in life, and that is our undoing."

Here Mr. Brown returned to the subject of philanthropy. Continuing he said: "If we could only convince our men of wealth who are so desirous of perpetuating their names by enormous gifts to this or that charity that the hope of the future generation and those to follow lies in equipping men and women to put in and take from the soil products that would relieve the crying need for a lower cost of living. Some of our men of colossal means give their millions to found libraries, others establish art galleries, while others choose various means of 'educating' the public. But the education we most need is that of fitting men and women for positions where they cannot only help themselves but help others as well. I would like to see several of our very wealthy men get together and found a fund from which any deserving boy and girl could draw while attending an agricultural school. After they had perfected themselves in the science of farming—for it is a science now—if they haven't the means to start out for themselves they could draw still further on this fund and get the farm they want and properly stock it. The trustees of the fund could secure themselves so that there would be little or no risk attached to this additional cash advance. Then the young graduate could pay off his loan in installments, and before long we would have our deserted farms in a high state of cultivation, and at the hands of men and women who recognize the advantage of caring for their soil and fostering it so that it could be made to produce tenfold what it gave up when they took hold of it. By this you can readily see that the producing power of the nation would be increased many times, and instead of our rapidly growing population being compelled to pay prohibitive prices for all the little necessities of life they could do their marketing at reasonable rates, and at the same time the farmer would be making a good profit on his labor and investment."

## Virginia Apple Orchards

At \$15.00 per Acre and Up

Remarkable opportunities are offered you to locate in the famous Piedmont section. Values like these unheard of. Now is the time to locate in the fifth apple growing state in this country. Bountiful results from all varieties—Baldwins, Albemarle Pippins, Grimes Golden, York Imperials, Winesaps, etc. Peaches, pears, plums, etc., grown with greatest success. Ideal climate—no extremes of heat or cold. Good roads. Markets nearby, where highest prices are obtained. Freight rates low. Write at once for our booklet, "Virginia Farm Lands." Gives detailed information. Address Department 14

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**THE** farmer who knows the plain truth about paint is not at the mercy of either paint fakirs nor fake painters. He knows what to ask for in his specifications and how to get what he specifies.

The "Handy Book on Painting" gives in concise and practical form the plain facts about the most durable of all paint, made from

## Dutch Boy Painter

### Pure White Lead

When competent help isn't handy, the farmer who understands paint can do a pretty good job himself, especially on the small painting, such as fences, sheds and tools.

Ask for Farm Helps No. 162 and if there are children in your family or your neighbor's family, ask for the Dutch Boy Painter's Book for the Children.

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## Idaho Pine Makes the Best Fruit Boxes

MANUFACTURED BY THE

**LEWISTON BOX CO., Lewiston, Idaho**

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AS A RULE KNOW THAT

# Pearson Nails

(CEMENT COATED)

are **BEST** and **CHEAPEST**

AND USE THEM

Those who do not, will some day  
We can afford to wait, but *can you?*

*"Ask Your Box Maker"*

**Beware of Imitations!**

**Insist on PEARSON'S!**

**J. C. PEARSON CO.**

**SAN FRANCISCO & BOSTON**

**SOLE MANUFACTURERS**

**A. C. RULOFSON CO., 315 Monadnock Building, San Francisco**  
**Pacific Coast Sales Managers**



# A Winning Hand

I Am Not a Silver-Tongued Salesman; but a Farmer, Mechanic and Fruit Grower. The First Tower Cultivator Shipped to me, was Bought for My Own Use.

I said: "WONDERFUL WORK." Good for Sore Eyes. My Words Echoed Throughout Idaho, Oregon and Washington.

## One Year Ago

I started on this Instantaneous Success. Eighteen Demonstrations Sold Twenty-two Machines in Nampa Territory, and still selling.

Twenty Minutes' work on Buckskin Land. Result a sale; eight sold through this to date—and orders still coming.

The sale of 10-foot Orchard Cultivator to Idaho Land Co. at Parma in 1911 resulted in order for Nine More this spring.

Everywhere Demonstrations made Sales, and—Sales brought more Orders.

Mr. Silas Wilson says: I Have Talked Your Machines All Day, since seeing the Fine Work they do on Our Orchard Tracts.

Mr. Schmidt says: I Have Done More and Better Work with your "Tower" Cultivator, in Three Hours, than with Extension Disc in ten hours.

Mr. Stephens says: I Heartily Recommend the "Tower" Orchard Cultivator to Orchardists and Nurserymen.—E. F. Stephens, president Stephens Orchard Company.

S. A. Rhodes says: Brought My "Tower" From Missouri Eleven Years Ago. Not a Cent for Repairs. Good Today.

ARE YOU FROM MISSOURI

I Want YOU to be from KANSAS, too, so I can put More Facts in YOUR HANDS.

## Sit Up and Think

Oh, You Farmers and Orchardists—

That I have Demonstrated against five of the best So-Called Orchard Implements, and Orders were My Prize.

And—That I Sold Four Machines to Two Neighbors This Season, Who Had Watched the Wonderful Work and Sales of these Machines "For a Year and a Day."

If You Can't Be a Bell-Cow Fall in Behind.

PRICES \$29.00 TO \$37.00

Keep Me Busy Write Today Quick Delivery

R. A. Baker, WESTERN AGENT THE TOWER LINE Nampa, Idaho

## Suppression of the Mediterranean Fruit Fly

From the Hawaiian Star

**F**OLLOWING is the report in full of the special committee of the Board of Agriculture and Forestry upon the suppression of the Mediterranean fruit fly: "Your special committee appointed June 27, 1911, to assume temporary charge of the campaign against the Mediterranean fruit fly begs leave to report as follows: Several meetings of the general committee have been held, at which the subject of control by clean culture methods have been fully discussed. Literature on the subject of the fruit fly and its control, as adopted by other countries, has been studied more particularly by the entomological members of the committee. The question of searching for possible effective parasites has also been discussed. Sub-committees to secure co-operation of territorial and county officials have been appointed. Educational literature on the subject of 'clean culture' in the fruit garden has been distributed amongst householders of all nationalities, and the committee has further

taken up the whole question of the fruit fly pest with Mr. Cairnes of the California Horticultural Commission. This gentleman was sent here by the California authorities for the special purpose of investigating local conditions as regards the Mediterranean fruit fly, and we are given to understand by him has conducted breeding experiments of his own, besides securing data from our local entomologists, who have conducted and are still continuing experiments with certain fruits, which up to the present have not been affected by the fly.

"Your committee appreciates the desire on the part of the Territorial Board of Health to co-operate and assist your advisory committee in its campaign against the fruit fly. The health department, at the request of the committee, instructed all its inspectors to include in their sanitary work the gathering up of all fallen fruit by householders and having it conveyed to the adjacent thoroughfare, where it could be hauled away by the county garbage department. This system was the only feasible plan which your committee could undertake, as no funds have been provided for the appointment of its own inspectors. Your committee desires to express its appreciation of the assistance granted by the health board, and does not doubt that it will continue its co-operation in the future. Unfortunately the system of having only sanitary inspectors attend to this important feature of having all fallen or infected fruit destroyed is not altogether satisfactory to your committee, and the purposes for which it was appointed. It must be apparent to all that the primary work of the health inspector is to keep all premises in his section in a sanitary condition, and inspection as to fallen fruit can only be considered as subsidiary to the regular work for which he is paid. Daily or bi-weekly reports of the health inspector to his department cover sanitary matters only, and your committee

deems it necessary that special reports as to fruit conditions should be sent in methodically to the executive officer of this committee. It would be unreasonable to expect the health authorities to cover the ground required, even were all the inspectors able to do this. These latter have all their work cut out for them and, as before stated, are obliged to give the matter of gathering fallen fruit a second thought only. Unless your committee is provided with sufficient funds to employ its own inspectors, the present system (which we consider unsatisfactory and inefficient) will have to continue.

"As regards the transportation and incineration of infested and fallen fruit, your committee desires to report that within certain limits such fruit is conveyed, together with other garbage, by the county garbage department to the Kakaako and Iwilei dumps and there burned. The system of burning

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MAKES

## Whiter, Lighter Bread

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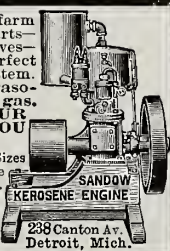
THE FRUIT-GROWER, BOX 110, ST. JOSEPH, MISSOURI

**Sandow \$37<sup>50</sup>**  
2½ H. P. Stationary Engine—Complete

Gives ample power for all farm uses. Only three moving parts—no cams, no gears, no valves—can't get out of order. Perfect governor—ideal cooling system. Uses kerosene (coal oil), gasoline, alcohol, distillate or gas. Sold on 15 days' trial. YOUR MONEY BACK IF YOU ARE NOT SATISFIED.

5-year ironclad guarantee. Sizes 2½ to 20 H. P., at proportionate prices, in stock, ready to ship. Postal brings full particulars free. Write for proposition on first engine in your locality. (116)

Detroit Motor Car Supply Co.,



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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT



on the dumps, as adopted by the county authorities, is altogether unsatisfactory so far as fruit is concerned. It is not in our province to go into detail as regards the burning of other garbage, but we desire to protest against this method of destroying fruits infected by fruit fly. Members of your committee, accompanied by Mr. Cairnes of California, have thoroughly inspected these dumps and the system adopted of burning fruit, etc., and as a consequence have had several interviews with members of the health committee of the Board of Supervisors as well as officials of the garbage department for the purpose of inducing them to repair the government garbage crematory so that that incinerator could be used for the purpose it was intended for. Your committee has not succeeded in its efforts to get the Board of Supervisors to make a change in their system of burning garbage, which is the more deplorable, as the dumps now in use are anything but sanitary and flies of all species are breeding there by the million. Your committee might go into some disgusting details in regard to this matter, but refrains from doing so in this report. It is unfortunate that the county authorities appear to have no desire to assist or co-operate to the extent necessary, and it is still more unfortunate that because of existing conditions your committee is without any funds to otherwise dispose of the infected fruit.

"In order to prevent if possible further the quarantine on certain island fruits, and in order to more fully comply with the requirements, which at any time may be called for by the Horticultural Commission of the State of California, and to more effectively control the Mediterranean fruit fly on this island, your committee deems it necessary to make the following recommendations, viz.: That the executive officer be empowered to appoint not less than eight inspectors, whose special work will be to systematically inspect such sections of fruit gardens, orchards, etc., on this island as circumstances may demand. That an official request by your honorable board be made to the county supervisors to appropriate sufficient funds to operate the county incinerator. We are informed that the sum of \$1,000 to \$1,500 only would be needed to provide the present plant with an oil burning apparatus, which, if done, would make it economical to operate. Failing such appropriation by the county, it is recommended that funds be otherwise contributed for this specific purpose. That your honorable board consider the advisability of securing the services of an experienced economic entomologist to search for an effective parasite or parasites on the Mediterranean fruit flies. The necessity for the appointment of the best man available for this purpose is paramount. The appointment of an assistant might, if necessary, be made later on, dependent on the results obtained. The work undertaken for the control of the Mediterranean fruit fly in this

## Dull Ax sharpened in 3 Minutes

"It took just 3 minutes to put a very dull ax in perfect shape," writes J. W. Suddard, Newark, Del.—Another letter says: "My ten year old boy ground several chilled plowshares—he sharpens all the tools on the place," writes J. O. Smith, Woodville, Ky.

Over one-half million farmers know this to be true and sharpen their sickles, discs and all farm tools with the

### Luther Farm Tool Grinder

It is a wonderful tool grinder—the only all steel frame grinder made—has shaft drive like an automobile—enclosed bearings—gravity lubrication. Has 30 different attachments for doing all kinds of difficult tool sharpening, also rip saw, jig saw, drill, milk tester attachment, lathe, forge, etc.

**Fast Sharpening Wheels Save Time.** Luther Tool Grinders have Dymo-Grit sharpening wheels. 25 times faster than grindstone—10 times more efficient than emery. Will not draw temper

**FREE TRIAL ON YOUR FARM**

Send for special offer which permits you to use this outfit on your farm 30 days free without advance payment; also 40 page book which tells everything and hundreds of letters from satisfied users.

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ESTABLISHED 1878

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California, Oregon, Washington, Idaho and Florida fruits. Apples handled in all European markets at private sale. Checks mailed from our New York office same day apples are sold on the other side. We are not agents; **WE ARE SELLERS.** We make a specialty of handling **APPLES, PEARS AND PRUNES** on the New York and foreign markets. Correspondence solicited.

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## Astounding Poultry Results!

Experiments carried on at the State Experimental Station and published by the U. S. Department of Agriculture, in Farmers' Bulletin No. 97, show that starting with chickens one-half week old, those fed *animal meal* in connection with grain reached **three pounds in weight eight weeks sooner** than those fed on grain only and **less food was consumed for each pound of gain in weight.** Also some of the pullets fed animal matter **began laying four weeks earlier** than the grain-fed birds.

### Union Meat Co.'s Beef Scraps—60% Protein

Make your poultry grow faster and lay sooner than if fed only on vegetable matter and at a less proportionate cost. Send for further information—free upon receipt of name and address.

**UNION MEAT CO., Dept. 24, North Portland, Oregon**



territory should not be only confined to 'clean culture' and such other methods. Whilst such work assists to a great extent in minimizing the attack of fruit by the fly, yet in the opinion of your committee the most effective work of control would be by the successful introduction and establishment of a suitable fruit fly parasite or parasites. Nature's method of control by such means has proved in the end much more satisfactory than other economic measures. As no effective parasite of the Mediterranean fruit fly is as yet known to entomologists it will take considerable time to search for one, and even then the venture may be a failure. It is well worth trying for, however, and the money spent in a systematic and intelligent search will be trivial as compared with the results that a successful introduction and establishment of an effective enemy would have on our fruit industries. For the purposes above outlined and for incidental and other expenses connected with the campaign, your committee deems it necessary that an appropriation of at least \$17,500 be provided for, this sum to cover a period until the legislature next convenes."

#### A DESERVED COMPLIMENT

The board of managers of the Second National Orange Show, held at San Bernardino, California, February 19-24, 1912, awarded a special prize to A. C. Rulofson, Pacific Coast representative of J. C. Pearson Company, the "cement coated nail people," for being "best booster" at the show. The same compliment has been extended to Mr. Rulofson by the managers of the National Apple Show at Spokane. While the "Pearson" nails make a hit everywhere, so does Mr. Rulofson, as he is one of the features of every fruit show held on the Coast. The J. C. Pearson Company gave away a beautiful silver trophy, which was won by the Orange Heights Fruit Association of Corona, California, for the best citrus fruit display. If all nail manufacturers were as liberal and enterprising as the "Pearson" cement coated nail people it would add greatly to the success of the fruit shows. \*

HENRY FIELD SEED CO.

Shenandoah, Iowa

Editor Better Fruit:

I want to warn you right now that if you are in any way afraid of getting the "back to the land" bug so badly that you will have to abandon your office and take to the tall grass you had better not read the book I am mailing you under separate cover. It is "The Book of a Thousand Gardens," and is the best bunch of real red hot garden dope I ever saw. It is not highly literary, only fairly well printed and not artistically perfect, but it has the real human interest, and I will guarantee that if you start in reading it you will be content to let the office boy and the office cat run the office till you get to the last page. Yours truly, Henry Field.

#### GRAFTING WAX FORMULA—WALNUT WAX

Resin, five pounds; beeswax, one pound; finely pulverized charcoal, one-half pound; raw linseed oil, one gill. After melting the beeswax and resin over the fire that is not too hot add the charcoal, stirring steadily, then add the oil. After molding the bricks it should be placed in greased pans. As one needs to use the wax it may be broken off in lumps and melted in suitable dishes. It should be in liquid form when applied.

Editor Better Fruit:

Your letter at hand and read with a great deal of interest. I have also looked over what you have written about the paper. You certainly have a mighty nice paper, and another year I am going to give you more of my advertising. I have practically nothing more to come this year, but I am going to see to it next year that you get all that is coming to you. Come again. Yours truly, Henry Field Seed Company, Henry Field, president, Shenandoah, Iowa.



**You Should Have This New John Deere Book**  
Illustrates and describes the most complete line of farm implements. Tells how to adjust and use them under varying conditions. It is a practical encyclopedia for the farm. It is worth dollars to you.

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If you have not already received your copy of this new book, be sure to ask us for it now.

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**Davenport Roller Bearing Steel Wagons**

**Buy Your Wagon Once For All**  
There is a wagon made that is stronger, more durable and of lighter draft than any other. This wagon is

**Built Like a Bridge**  
Entirely of steel I-Beams, Channels and Angles, solidly held together with large steel rivets, put in hot under great pressure. Like the steel railway bridge, it is constructed for hardest lifetime service. Strong and durable. Each front gear and each rear gear is practically one solid piece that cannot come loose or apart.

**Steel Wheels**  
This wagon has steel wheels that are trussed and made with a tension,

**Roller Bearings**  
That roller bearings reduce draft is generally conceded. Of the various styles, the straight roller bearing is the simplest and most successful. For this wagon the straight roller bearing is especially adapted. The spindles and hubs are straight. Consequently, as this wagon is equipped with straight roller bearings it is of light draft. A little hook we'll be pleased to send free, tells of a good many more superior features this wagon has.

**The Roller Bearing**

*Be sure to tell us whether you want your copy of "Better Farm Implements and How to Use Them" and in order to get the "Wagon Book" containing full information regarding the above described wagon, ask for Package No. B46*

**JOHN DEERE PLOW COMPANY, MOLINE, ILLINOIS**

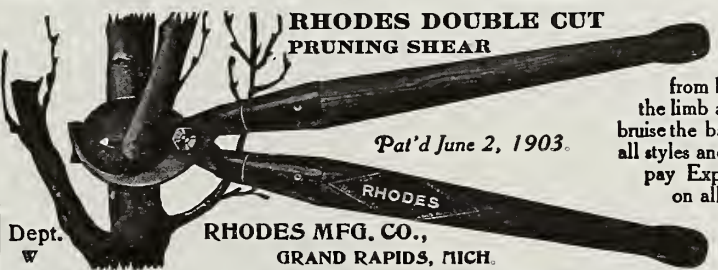


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**THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. We pay Express charges on all orders. Write for circular and prices.**

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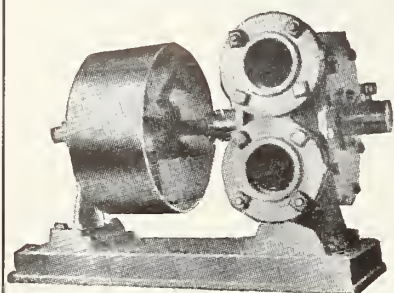
We will be glad to furnish you with full details of our valley and give you a list of what we have for sale in improved and unimproved land. At the present time we have some desirable buys. Will send you literature on request.

Reference: Any bank or business house in Hood River.

**Guy Y. Edwards & Co., Agents**  
HOOD RIVER, OREGON



**"The Pump You Have  
Always Wanted"**



Patented June 2, 1903  
Improvements Pending

## The Ideal System of Irrigation

Saves power and money; utilizes the power and converts it into results; high heads without staging; surface use, or wells, pits, mines or reservoirs; mechanical perfection; simplicity; easily installed; free from usual wear; adjustable to take up wear; strong, compact, positive, faithful and efficient machine. Costs more because worth more, because it saves more than it costs over other machines. Many sizes: 10 gallons per minute to 1,000 gallons per minute, \$30 to \$625. Address

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Seattle, Washington

## Citrus Protective League of California

By G. Harold Powell, Secretary and Manager

**W**ORK of the Citrus Protective League in 1911 has been concerned with questions relating to its governmental relations, such as customs tariffs, with freight and refrigeration rates and with matters affecting the general upbuilding of the industry. At the beginning of the year an investigation of the cost of producing citrus fruits in California was authorized by the executive committee of the league, and later a similar investigation was authorized to cover the industry in Italy and in Spain.

The lemon industry in Sicily and the orange industry in Spain were investigated in the spring of 1911. Data has been accumulated from growers, speculators, business men and from official sources showing the variation in the cultural costs, and in the cost of handling the fruit in the groves and packing houses. They also cover official data relating to the international movement of lemons, the customs tariffs in different countries, the history of the American tariff on citrus fruits, the cultural practices in the industry, the business methods in Italy and in America, the freight rates to the principal markets of the world and other data that throw light on the general lemon question. A report on the entire foreign lemon industry has been prepared. The league was fortunate in having the assistance and experience of Mr. Frank F. Chase, vice-president of the National Orange Company of Riverside, who accompanied the secretary in making the investigation abroad.

An investigation has been made of the cost of producing citrus fruits in California. The details cover representative groves of all kinds and sizes in every citrus producing section in California. The accounts cover several hundred representative citrus growers and shippers, and show in detail the investment in the groves and in permanent equipment and improvements, the cost of the cultural operations and of handling the fruit, the yields and the distributing costs of lemons and oranges separately. These data are more extensive than have ever been

brought together in connection with an American agricultural industry. They make it possible to compare the foreign industries with those in California and furnish the information necessary to determine the tariff duties needed to safeguard our American citrus interests. The data, when published, will

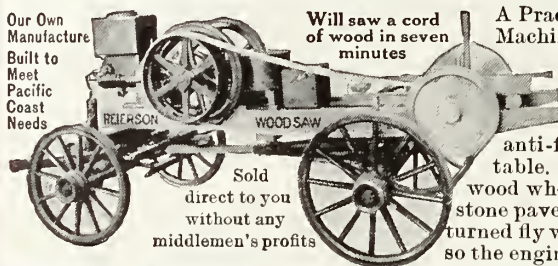
be of great value to the California citrus industry in showing the status of the costs of cultural and fruit handling practices.

At the special session of congress in 1911 a number of attempts were made to remove the duty on oranges, grape fruit, lemons and other citrus fruits,

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Owners of the **Reierson Wood Saw** make \$10 to \$20 per day right along

Our Own  
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Will saw a cord  
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A Practical, Durable, Efficient Machine, priced within your reach. Equipped with 6 h. p., frost proof, water cooled, Waterloo Boy Gas Engine. Selby anti-friction roller steel saw table. Wide tired steel or wood wheels for rocky roads and stone pavements. Heavy, machine turned fly wheels for arbor mounted so the engine fly wheels straddle the

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Built to make short turns in alleys, etc. frame, thereby overcoming top heaviness.

Positively the best wood saw made—stands every test. A great money maker. Write today for full description and prices. Ask for catalog W 6

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## Find Out About the Forkner Light-Draft Harrow!



**T**HIS low-priced harrow for orchards and vineyards—and general use—is a world-beater. Wonderfully light of draft—weight carried on wheels, not on horses' necks. Great worker—20 to 30 acres a day with one team—and every inch of soil cultivated thoroughly—lifted and turned in long wavy level. Best of all—it hangs low and has great extension—making it a snap

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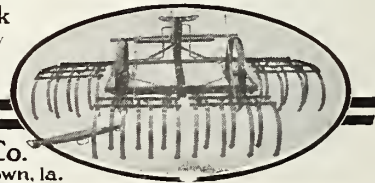
month—and send it back if you don't find it the finest cultivator made.

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**BEST IMPLEMENT  
FOR ORCHARD CULTIVATION**



**Kimball Cultivator at Work in Orchard at Morrisania**

For maintaining a dust mulch in an orchard and for keeping down weeds the Kimball Cultivator is without an equal. Its blades cut about three to four inches under the surface of the soil, pulverizing the soil and leaving it level; all weeds are cut and germination of weed seeds prevented by leaving the soil in loose condition.

The Kimball Cultivator works well out from the horses, and soil can be stirred close to trunks of trees, with horses walking out in the open. The Kimball takes a wide sweep at a time, and eight to ten acres of orchard can be cultivated per day. Thousands of Kimball Cultivators are now in use, and every person who has one recommends it. Mr. Irvine, editor of *The Fruit-Grower*, used two Kimball Cultivators at Morrisania last season; ask him what he thinks of them. Ask him also if the Kimball is not an ideal cultivator for any part of the country; he will tell you it is an ideal soil-stirring implement.

## Clean Cultivation of Orchards Pays

It not only conserves moisture, but destroys the hiding places of insects, such as curculio, which are often serious orchard pests. Apples grown in cultivated orchards ripen later and consequently keep longer; they are of larger size and are usually smoother. The cost of cultivation is not excessive if Kimball Cultivators are used. Send for free booklet describing this great orchard implement—it's free for the asking.

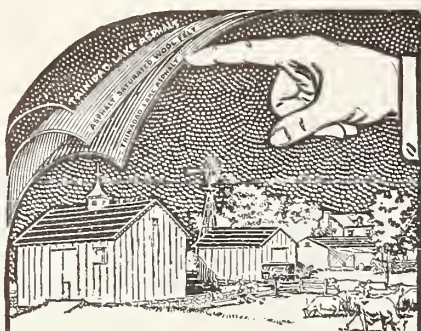
**W. A. JOHNSTON, Manufacturer**  
**THE DALLES, OREGON**

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

the proposed legislation being directed particularly against the lemon. A free lemon item was attached to the free list bill in the house, and was passed for political effect. If enacted into law the free lemon tariff item would have sacrificed an American industry, and would have violated every principle that underlies the fixing of tariff duties, either from the revenue or the protective point of view. The present tariff on lemons protects the American industry; it is an increasing revenue producer, and it has not increased the price which the consumer pays. Through the efforts of the senators from California the free lemon item was defeated unanimously in the senate. The citrus item is likely to appear again at the present session of congress. The demand for a reduction in the duty on lemons is created artificially by a well organized New York lobby that is maintained by the exporters of lemons in Sicily and the importers of lemon in New York, sixty per cent of the total imports being controlled by twelve New York fruit firms. As long as the lemon item continues to serve as a political asset, and the foreign exporters and New York importers can be induced by the lobby to pay money into its hands, the lemon controversy is likely to continue.

About two years ago the Citrus Protective League made an investigation of the method of determining decay in imported lemons. Under the law, decayed fruit is considered as a non-importation and is not subject to duty. The amount of decay is determined by the treasury department, and allowance for the decayed fruit is made in the liquidation of the duties. The league became convinced that the importers were receiving refunds in excess of the actual amount of decay, and that the full amount of duty was not being paid; or, to state it differently, that a large amount of sound fruit was entering the country duty free. The matter was placed before the secretary of the treasury, who caused an investigation to be made. As a result it was found that importers had been paid in refunds about ten per cent of the total duty collected by the government during the first ten months of 1909 and 1910. The refunds rose to nearly twenty per cent of the total duty collected in some months. The treasury department issued a new regulation June 17, 1911, which provides that "The government will adopt as its samples to be weighed for the purpose of estimating the amount of rot in a given cargo the same samples that the sellers expose as samples of the cargo for the purpose of sale, irrespective of the number or character of the samples, which sale samples must be selected in the presence of a customs officer, and examined immediately thereafter." The new regulation which cuts off the excessive refunds has been continuously assailed by the importers since its adoption on the score that the careful examination of the samples destroys their commercial value. The action of the treasury department has





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prevent damage to eggs, garden truck, fruits, live stock on road to market. Make any wagon a spring wagon! Soon save cost—produce brings bigger prices—wagon lasts longer—horses benefited—thousands in use—"my wagon rides like auto" says one. Get a pair at dealers. If not at dealer's write us. Insist on Harvey's. 40 sizes—fit any wagon—sustain any load to 10,000 lbs. Catalog and fistful of proofs free. HARVEY SPRING CO., 784 17th St., Racine, Wis.



protected our industry against the unfair competition to which it was subjected, it fully protects the revenues of the government and it enforces commercial honesty on the part of the importers.

Through the attorney for the league, Mr. A. F. Call, the growers and shippers in the lemon rate case appeared before Judge Mack of the United States Commerce Court, in Los Angeles, in March, 1911, and before the full court in Washington in April, in connection with the injunction issued by the Circuit Court of the United States for the district of Kansas, which, on appeal by the railroads, restrained the Interstate Commerce Commission from making the one dollar rate effective. The Circuit Court referred the case to the Commerce Court for a hearing on the legal questions involved. The United States Commerce Court, October 5, 1911, issued a permanent injunction restraining the enforcement of the order of the commission, which had the effect of restoring the \$1.15 rate, and referred the case back to the commission without prejudice to a reopening and reconsideration of the original proceedings. The order of the Commerce Court was based primarily on the ground that the rate of the commission had been established on grounds other than traffic considerations, and that the commission, in fixing the \$1 rate, acted beyond the powers delegated to that body. The Interstate Commerce Commission reopened and reheard the case on supplemental proceedings November 15, 1911. The league was represented before the commission by Mr. Call. The Interstate Commerce Commission, December 11, 1911, declared the rate of \$1.15 to be unreasonable and unjust, and ordered the railroads to establish, on or before February 15, 1912, a rate not to exceed \$1 per hundred pounds. The commission permitted the railroads to require the shippers to load collapsible bunker cars, when presented with the bunkers thrown up, to full capacity, not exceeding two tiers in height, making a load of 34,000 pounds.

The efforts of the league will save the lemon industry \$200,000 annually when the \$1 per hundred rate is finally established. In referring to the orange rate the commission, in its opinion, says: "If this lemon rate is to be measured by the orange rate, then we think that the orange rate should be reduced in determining a fair relationship, not that the lemon rate should be advanced. . . . And we desire to call attention to the fact upon that aspect of the case, that, in our opinion, the rate of \$1.15 applied to the movement of oranges is an extremely liberal one." The league asked the commission for reparation on all shipments moving under the \$1.15 rate which were included in the suit, and the commission has awarded the reparation on the basis of the \$1 rate established, the details as to the awarding being reserved for further consideration.

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stands everywhere for the latest-improved, most useful, and economical farm and garden tools. Products of 35 years' experience by a practical farmer and manufacturer who has made a science of tool-building. 55 tools; guaranteed.

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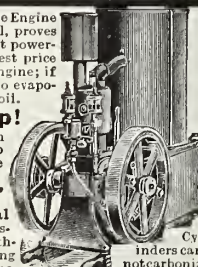
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Gasoline is 9c to 15c higher than coal oil. Still going up. Two pints of coal oil do work of three pints gasoline.

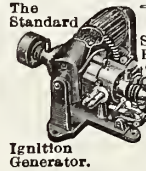
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—only engine running on coal oil successfully fuses alcohol, gasoline and benzine, too. Starts without cranking. Only three moving parts—no valves—no sprockets—no gears—no valves—the utmost in simplicity, power and strength. Mounted on skids. All sizes, 2 to 20 h. p., in stock ready to ship. Engine tested before crating. Comes all ready to run. Pumps, saws, threshes, churns, separates milk, grinds feed, shells corn, runs home electric lighting plant. Prices (stripped), \$29.50 up. Sent any place on 15 days' Free Trial. Don't buy an engine till you investigate money-saving, power-saving "DETROIT." Thousands in use. Costs only postal to find out. If you are first in your neighborhood to write, you get Special Extra-Low Introductory price. Write Detroit Engine Works, 507 Bellevue Ave., Detroit, Mich.

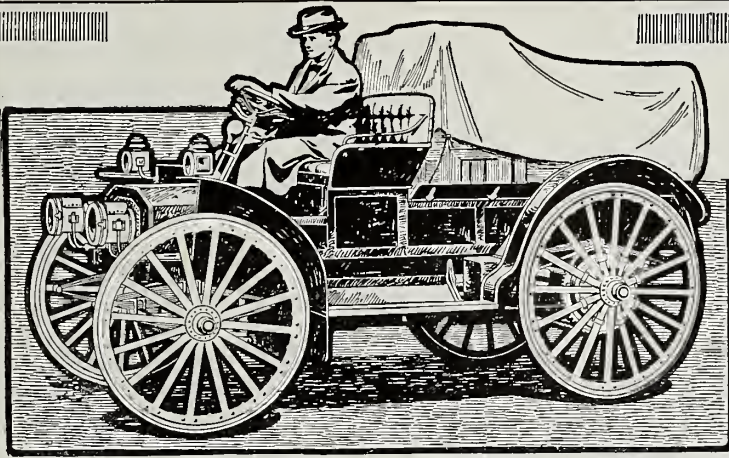


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WITH an International auto wagon, you can do all your road work and light hauling in one-half the time, and at less cost than with horses. You can save hours in taking your produce to the market or railroad station—save hours in going to mill or creamery.

## It Will Pay You

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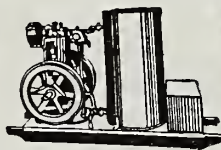
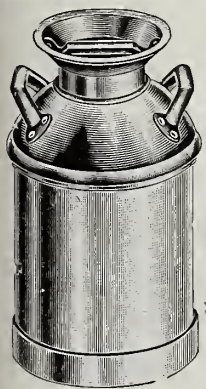
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In connection with the bond given by the shippers when the injunction was granted by the Circuit Court for the southern district of California in 1909 restraining the railroads from collecting the \$1.15 rate until the reasonableness of the advance could be passed on by the commission, the shippers have paid through the league to the credit of a surety company approximately \$365,000, the amount representing fifteen cents per hundred pounds on the weight charged by the transcontinental railroads on each car of lemons shipped into the territory embraced in the advance. This money is to be held until it is finally adjudged whether the restrained rate (\$1.15 per hundred weight) is legally established and is legally enforceable, when it will be paid to the railroads or to the shippers, depending on the outcome of the case. The United States Circuit of Appeals for the ninth circuit, on appeal from the railroads, reversed the decree of the Circuit Court for the southern district of California and dismissed the suit on the ground that the latter court acted beyond its authority in granting the original injunction. The final decree dismissing the bill was issued by the Circuit Court of the United States for Southern California November 21, 1911. Since November 21, 1911, the railroads have collected \$1.15 per hundred weight on all lemons shipped into the territory in controversy. This practice will continue until the order of the commission becomes effective.

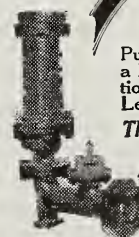
As a result of an action brought by the league the Interstate Commerce Commission, January 14, 1911, ordered the transcontinental railroads to desist from charging \$30 per car for pre-cooling oranges transported in carloads from Southern California to points designated in T. F. B. East-Bound Tariffs No. 3-1 and No. 7-0, and further ordered the railroads to maintain a charge not to exceed \$7.50 per car when the fruit was pre-cooled and pre-iced by the shipper and not re-iced in transit. After the decision of the commission the railroads cancelled the rule authorizing the pre-cooling and pre-icing privileges by withdrawing their tariffs which provided these rights. At the request of the league these cancellations have been twice suspended by the commission, the last extension of the Santa Fe expiring February 24, 1912, and of the Southern Pacific and the Salt Lake Railroads April 28, 1912. In May, 1911, the rail-

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Pump it automatically with a Phillips Ram. No attention. No cost of operation. Let us tell you about it.

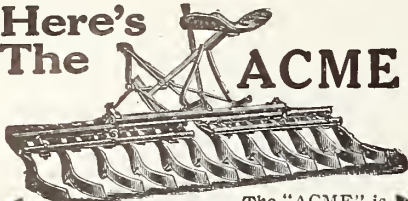
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The "ACME" is the only Harrow that cuts, crushes, turns, smoothes and levels in one operation and is a perfect weed exterminator and surface mulcher. There are no lumps or air spaces between the furrows after using the "ACME." Your soil is in the condition of a perfect seed bed. The subsoil has been properly packed and the top soil mulched to attract and conserve all the moisture. The coulters cut through to the under soil, leaving the trash that has been turned under, beneath the soil where its fertilizing qualities may benefit the growing crops. There are sizes 3 to 17½ feet wide. Each

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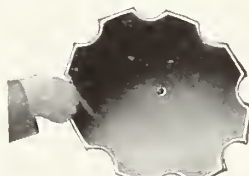
## FORGED DISK BLADES

There is as much difference in the quality of the material used in the blades of disk harrows as there is in pocket knives. Some knives are made to sell at ten cents and others at a dollar. Many disk blades belong to the ten cent pocket knife class, but are worked off on buyers with the rest of the machine at the same price for which the best are sold. Consequently, the farmer cannot be guided by price.

The Cutaway Harrow Co. has built its remarkable reputation largely by the quality of the disks on its tools. It has had a real sincere ambition to give to the farmer the best disk blade he could buy. Their motive for so doing has been as much one of pride as of profit. The latter came because the policy of high quality paid.

Their one object has been constantly in view—the best blade possible. To accomplish that, forging the edges became a part of the process. Now all Cutaway Harrow Co.'s disk blades are forged. If you don't fully realize the advantage of forging, ask your blacksmith why a forged edge is better than any other. He will tell you why no other method is so good. This forged edge feature shows how the Cutaway Harrow Co. is doing the things necessary to produce the best tools. It is an indication of merit throughout every tool they make. Every buyer should demand Cutaway forged disks. They cost no more, and are many times better. If you will write them at 940 Main St., Higganum, Conn., they will send you complete information on the construction of Cutaway machines. It would pay every farmer to give them his ear. Write a post card today.

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**IMPROVED STANDARD DRILLING MACHINE**  
One Man Can Handle  
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roads attacked the order of the commission before the United States Commerce Court on the ground that the shippers have no legal right to pre-ice the cars, and also that the rate of \$7.50 was confiscatory. The court held that the question of the legality of pre-icing was not decided by the commission, and on May 29, 1911, denied the injunction. On the \$7.50 rate itself the court has not yet passed. At the termination of the present suspension of the tariffs the case as to the right of the shippers to pre-ice the cars will be argued before the commission. In all of these cases the interests of the growers and shippers have been directed by Mr. A. F. Call.

During the early part of the shipping season in 1911 there appeared to be an unusual amount of decay in oranges in transit. The conditions appeared to be due to the rush in handling the large crop and to other causes which made the fruit more or less susceptible to decay. The continuance of the decay would have caused a heavy financial loss to the industry. The United States Department of Agriculture, through previous investigations, had already determined that the losses from decay were primarily due to the improper handling of the fruit. The league secured the prompt co-operation of the department, which made a careful survey of the methods of handling the fruit and conducted extensive investigations as to the keeping quality of fruit handled in different ways in the spring of 1911. The industry responded generally to the work of the department, which had the immediate effect of improving the methods of handling the fruit in the groves and packing houses. A large amount of loss was thereby avoided. The department concluded that while the fruit appeared more susceptible to rot on account of climatic conditions, its investigations in the past were fully confirmed by the results, which again showed that the decay could be practically eliminated by handling the fruit with enough care to avoid mechanical injury.

The league has been successful during the year in securing the co-operation of the Bureau of Chemistry of the United States Department of Agriculture in establishing a laboratory for the experimental study of citrus by-products. This laboratory will be located in Los Angeles. Several attempts have been made to establish a citrus by-products business in California, but most of the efforts have had no effect on the industry as a whole. In Italy forty per cent of the lemon crop is converted into oil, citrate of lime and other by-products. There are several by-products made from the orange in foreign countries, and to a limited extent food products and confections are made in California. The work in Europe is done by cheap hand labor. In California methods will have to be worked out by which we can accomplish economically, by machinery, the results now attained in Italy by hand. The league will co-op-



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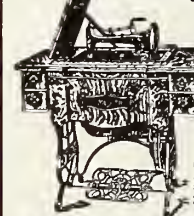
Stands for better farming and better crops. You use less seed, but better tillage. It teaches you how to breed and select seed, how to conserve moisture so that your crop will not be ruined in the hot, dry spell, and how to mature a crop on a small amount of rainfall.

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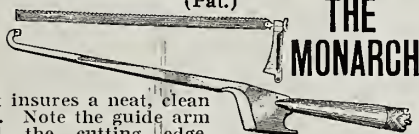


erate with the department in every way to make this investigation useful to the industry.

In August, 1911, the Board of Food and Drug Inspection of the United States Department of Agriculture issued an order in which it expressed the opinion that the coloring or oranges by holding them in a warm, moist atmosphere for a short period of time after removal from the tree conceals inferiority, and therefore, under the Food and Drugs Act of June 30, 1906, such oranges are considered adulterated. The decision was not intended to interfere with the marketing of oranges that attain maturity as to size, sweetness and acidity before the color changes from green to yellow. In Florida, early in the season, this decision was made the basis of a violent controversy between different trade interests. In order to protect the California industry from the consequences of such an agitation the league placed before the officers of the food board, at the beginning of the season, the details of the shipping practices in California. So far as we know, no cars of California oranges were seized under this regulation. As a practical measure, backed by California shippers, the regulation has accomplished what it intended to accomplish, namely, the prevention of the shipment of green, immature oranges that were not fit to eat. In that respect it has been a benefit to the California industry. In so far as maturity is concerned the early oranges shipped from California have never been more acceptable to the trade than they were in the fall and winter of 1911.

The league has secured the co-operation of the United States Department of Agriculture in an investigation of the principles underlying the nutrition of citrus groves. The co-operation of the department was also secured through the activity of the College of Agriculture of the State University. Through Professor Wickson the university has asked the department to undertake plant nutrition investigations in California. The state will

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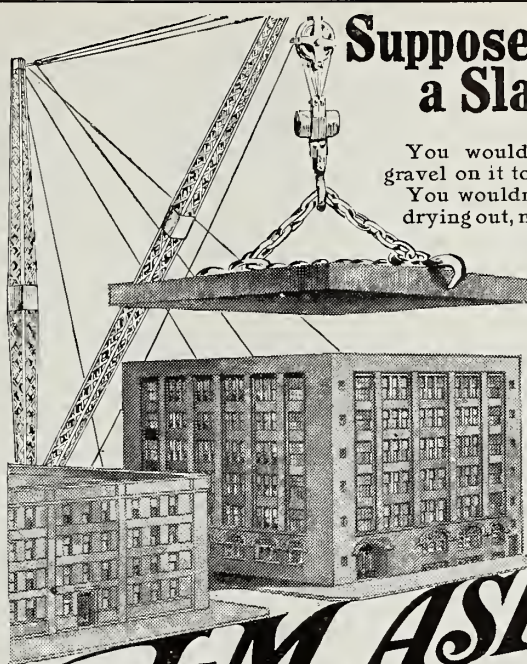


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J-M Asbestos Roofing is practically such a stone roofing. It consists of layer on layer of Asbestos (stone) Felt securely cemented together with Trinidad Lake Asphalt—two indestructible minerals.

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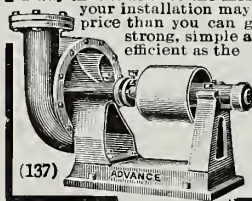
The new No. 5 1912 Model L. C. SMITH & BROS. TYPEWRITER is now ready for delivery. Every part of the machine moves with the utmost ease and precision, for the reason that the entire mechanism of the machine is mounted on ball bearings. The touch is light and elastic, as every operator of an L. C. SMITH & BROS. TYPEWRITER knows. There are many improvements in the 1912 Model never used on any other make of writing machine.

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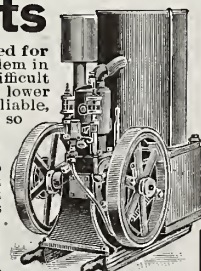
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co-operate by making its equipment and buildings available to the federal investigators, and it will facilitate the work of the department in every way to the end that some of the difficulties that exist under irrigated agriculture may be more fully understood. The investigation of the department will be comprehensive. It will include several of the most experienced plant nutrition investigators. The work of the department will be inaugurated in 1912.

The influence of the league has been considerably strengthened during 1911 by the addition of a number of new members, the present membership including practically all of the prominent growers and shippers of the state. The stability of the citrus industry, which represents an investment of \$175,000,000, and on which at least 150,000 people depend for a livelihood, has been reared on the ability of the growers and shippers to meet and solve their common problems collectively. If approached by the individual, as the problems of agriculture are generally attacked, the condition of our industry would be chaotic. The league is the medium through which the public policy questions that affect the entire industry may be handled, and through which every public spirited grower and shipper can co-operate in the general upbuilding of the industry. It avoids all questions that lie within the province of the established shipping and marketing agencies. It holds aloof from political controversies. It vigorously defends the growers and shippers whenever their interests are jeopardized by legislation, by unjust railroad rates or by other public policy relations. It develops a constructive policy for the improvement of the cultural practices of the growers and of the fruit handling methods of the shipper, and then secures the co-operation of the state and federal agencies best adapted to the investigation and upbuilding of these lines. The Citrus Protective League is a unique organization among the agricultural industries of America. It is applying the methods that have contributed so much to modern industrial progress to the problems of the orange and lemon grower. It exists as a part of the industry because its need was felt from within. It was organized by the growers and shippers, not as so many agricultural organizations are formed, by influences from without, but because it was felt that the industry must have an organized agency, just as every modern industrial business has, to safeguard and promote its public policy and general industrial problems.

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We will give the Farm Journal (Philadelphia) for two years (new subscription) and "Better Fruit" one year (old or new) for \$1.25. The Farm Journal is one of the best papers published on general farming in the United States. Any of our subscribers wanting a farm paper will find the Farm Journal valuable and instructive.

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FIRST AND OAK STREETS  
PORTLAND, OREGON





# Northwest Fruit Growers' Unions and Associations

We publish free in this column the name of any fruitgrowers' organization. Secretaries are requested to furnish particulars for publication.

## Oregon

Eugene Fruit Growers' Association, Eugene; Ashland Fruit and Produce Association, Ashland; Hood River Apple Growers' Union, Hood River; Milton Fruit Growers' Union, Milton; Douglas County Fruit Growers' Association, Roseburg; Willamette Valley Prune Association, Salem; Mosier Fruit Growers' Association, Mosier; The Dalles Fruit Growers' Union, The Dalles; Salem Fruit Union, Salem; Albany Fruit Growers' Union, Albany; Coos Bay Fruit Growers' Association, Marshfield; Estacada Fruit Growers' Association, Estacada; Umpqua Valley Fruit Growers' Association, Roseburg; Hyland Fruit Growers of Yamhill County, Sheridan; Newburg Apple Growers' Association, Newburg; Dufur Valley Fruit Growers' Union, Dufur; McMinnville Fruit Growers' Association, McMinnville; Coquille Valley Fruit Growers' Union, Myrtle Point; Stanfield Fruit Growers' Association, Stanfield; Oregon City Fruit and Produce Association, Oregon City; Lincoln County Fruit Growers' Union, Toledo; Rogue River Fruit and Produce Association, Medford; Mount Hood Fruit Growers' Association, Sandy; Northeast Gaston Farmers' Association, Forest Grove; Dallas Fruit Growers' Association, Dallas; Northwest Fruit Exchange, Portland; Springbrook Fruit Growers' Union, Springbrook; Cove Fruit Growers' Association, Cove; Santiam Fruit Growers' Association, Lebanon; Washington County Fruit Growers' Association, Hillsboro; Benton County Fruit Growers' Association, Corvallis; Sutherlin Fruit Growers' Association, Sutherlin; Brownsville Fruit and Produce Association, Brownsville.

## Washington

Kennewick Fruit Growers' Association, Kennewick; Wenatchee Fruit Growers' Union, Wenatchee; Puyallup and Sumner Fruit Growers' Association, Puyallup; Vashon Island Fruit Growers' Association, Vashon; Mt. Vernon Fruit Growers' Association, Mt. Vernon; White Salmon Fruit Growers' Union, White Salmon; Thurston County Fruit Growers' Union, Tumwater; Bay Island Fruit Growers' Association, Tacoma; Yakima Valley Fruit and Produce Growers' Association, Granger; Buckley Fruit Growers' Association, Buckley; Lewis River Fruit Growers' Union, Woodland; Yakima County Horticultural Union, North Yakima; White River Valley Fruit and Berry Growers' Association, Kent; Lake Chelan Fruit Growers' Association, Chelan; Zillah Fruit Growers' Association, Toppenish; Kiona Fruit Growers' Union, Kiona; Mason County Fruit Growers' Association, Shelton; Clarkston Fruit Growers' Association, Clarkston; Walla Walla Fruit and Vegetable Union, Walla Walla; The Ridgefield Fruit Growers' Association, Ridgefield; Felida Prune Growers' Association, Vancouver; Grandview Fruit Growers' Association, Grandview; Yakima Valley Fruit Growers' Association, North Yakima; Southwest Washington Fruit Growers' Association, Chehalis; The Touchet Valley Fruit and Produce Union, Dayton; Lewis County Fruit Growers' Association, Centralia; The Green Bluffs Fruit Growers' Association, Mead; Garfield Fruit Growers' Union, Garfield; Goldendale Fruit and Produce Association, Goldendale; Spokane Inland Fruit Growers' Association, Kelso; Elma Fruit and Produce Association, Elma; Granger Fruit Growers' Association, Granger; Cashmere Fruit Growers' Union, Cashmere; Stevens County Fruit Growers' Union, Myers Falls; Dryden Fruit Growers' Union, Dryden; Apple Growers' Union of White Salmon, Underwood; Spokane Valley Fruit Growers' Union, Spokane; Spokane County Horticultural Society, Spokane; Spokane Highlands Fruit Growers' Association, Chester; Spokane District Fruit Growers' Association, Spokane.

## Idaho

Southern Idaho Fruit Shippers' Association, Boise; New Plymouth Fruit Growers' Association, New Plymouth; Payette Valley Apple Growers' Union, Payette; Parma-Roswell Fruit Growers' Association, Parma; Weiser Fruit and Produce Growers' Association, Weiser; Council Valley Fruit Growers' Association, Council; Nampa Fruit Growers' Association, Nampa; Lewiston Orchard Producers' Association, Lewiston; Boise Valley Fruit Growers' Association, Boise; Caldwell Fruit Growers' Association, Caldwell; Emmett Fruit Growers' Association, Emmett; Twin Falls Fruit Growers' Association, Twin Falls; Weiser River Fruit Growers' Association, Weiser; Fruit Growers' Association, Moscow.

## Colorado

San Juan Fruit and Produce Growers' Association, Durango; Fremont County Fruit Growers' Association, Canon City; Rocky Ford Melon Growers' Association, Rocky Ford; Plateau and Debeque Fruit, Honey and

Produce Association, Debeque; The Producers' Association, Debeque; Surface Creek Fruit Growers' Association, Austin; Longmont Produce Exchange, Longmont; Manzanola Fruit Association, Manzanola; Delta County Fruit Growers' Association, Delta; Boulder County Fruit Growers' Association, Boulder; Fort Collins Beet Growers' Association, Fort Collins; La Junta Melon and Produce Company, La Junta; Rifle Fruit and Produce Association, Rifle; North Fork Fruit Growers' Association, Paonia; Fruit and Produce Association, Fruit; Grand Junction Fruit Growers' Association, Clifton; Palisade, Grand Junction; Palisade Fruit Growers' Association, Palisade; Peach Growers' Association, Palisade; Colorado Fruit and Commercial Company, Grand Junction; Montrose Fruit and Produce Association, Montrose; Hotchkiss Fruit Growers' Association, Hotchkiss; Paonia Fruit Exchange, Paonia; Colorado Fruit Growers' Association, Delta; Crawford Fruit Growers' Association, Crawford; Amity Cantaloupe Growers' Association, Amity; Pent County Melon Growers' Association, Las Animas; Capitol Hill Melon Growers' Association, Rocky Ford; Denver Fruit and Vegetable Association, Denver; Fair Mount Melon Growers' Association, Swink; Fowler Melon Growers' Association, Fowler; Granada Melon Growers' Association, Granada; Grand Valley Fruit and Produce Association, Grand Junction; Independent Fruit Growers' Association, Grand Junction; Kouns Party Cantaloupe Growers' Association, Rocky Ford; Lamar Melon Growers' Association, Lamar; Loveland Fruit Growers' Association, Loveland; Manzanola Orchard Association, Manzanola; Mandale Melon Growers' Association, Swink; Roaring Fork Potato Growers' Association, Carbonale; Woods Melon Growers' Association, Las Animas.

## Montana

Bitter Root Fruit Growers' Association, Hamilton; Missoula Fruit and Produce Association, Missoula; Woodside Fruit Growers' Association, Woodside.

## Utah

Farmers and Fruit Growers' Forwarding Association, Centerville; Ogden Fruit Growers' Association, Ogden; Brigham City Fruit Growers' Association, Brigham City; Utah County Fruit and Produce Association, Provo; Willard Fruit Growers' Association, Willard; Excelsior Fruit and Produce Association, Clearfield (Post-office Layton R. F. D.); Centerville Fruit Growers' Association, Centerville; Bear River Valley Fruit Growers' Association, Bear River City; Springville Fruit Growers' Association, Springville; Cache Valley Fruit Growers' Association, Wellsville; Green River Fruit Growers' Association, Green River; Farmers and Fruit Growers' Forwarding Association, Centerville.

## New Mexico

San Juan Fruit and Produce Association, Farmington.

## California

The Supply Company of the California Fruit Growers' Association, Los Angeles; California Fruit Exchange, Sacramento; Loomis Fruit Growers' Association, Loomis; Newcastle Fruit Growers' Association, Newcastle; Penryn Fruit Growers' Association, Vacaville; Turlock Fruit Growers' Association, Turlock; Winters Fruit Growers' Association, Winters; Lincoln Fruit Growers' Association, Lincoln; Lodi Fruit Growers' Union, Lodi; Fresno Fruit Growers' Co., Fresno; Stanislaus Farmers' Union, Modesto; California Farmers' Union, Fresno; Sebastopol Berry Growers' Union, Sebastopol; Sebastopol Apple Growers' Union, Sebastopol.

## British Columbia

British Columbia Fruit Growers' Association, Victoria; Victoria Fruit Growers' Exchange, Victoria; Hammond Fruit Association, Ltd., Hammond; Hatzic Fruit Growers' Association, Hatzic; Western Fruit Growers' Association, Mission; Mission Fruit Growers' Association, Mission; Salmon Arm Farmers' Exchange, Salmon Arm; Armstrong Fruit Growers' Association, Armstrong; Okanagan Fruit Union, Limited, Vernon; Kelowna Farmers' Exchange, Limited, Kelowna; Summerland Fruit Growers' Association, Summerland; Kootenay Fruit Growers' Union, Limited, Nelson; Grand Forks Fruit Growers' Association, Grand Forks; Boswell-Kootenay Lake Union, Boswell; Queens Bay Fruit Growers' Association, Queens Bay; Kaslo Horticultural Association, Kaslo; Creston Fruit and Produce Exchange, Creston.

Books we have read, own and recommend, which can be ordered of your local stationer, or direct. The initials after the name represent the publishers, whose addresses are found at the end of the list. These books can be ordered of the J. K. Gill Company, Portland, Oregon.

Fruits and Fruit Trees of America— <i>Downing</i> .....	W	\$4.50
California Fruits— <i>Wickson</i> .....	P	2.50
Success with Small Fruits— <i>Roe</i> .....	DM	.75
American Fruit Culturist— <i>Thomas</i> .....	WW	2.50
Strawberry Culturist— <i>Fuller</i> .....	J	.50
The Principles of Fruit Growing— <i>Bailey</i> .....	M	1.25
Bush Fruits— <i>Card</i> .....	M	1.50
Horticulturists' Rule Book— <i>Bailey</i> .....	M	.75
The Nursery Book— <i>Bailey</i> .....	M	1.00
Pruning Book— <i>Bailey</i> .....	M	1.50
Cyclopedia of Horticulture— <i>Bailey</i> .....	D	30.00
Nut Culturist— <i>Fuller</i> .....	J	.75
Insects Injurious to Fruits— <i>Saunders</i> .....	L	2.00
Fungi and Fungicides— <i>Weed</i> .....	J	1.00
Insects and Insecticides— <i>Weed</i> .....	J	1.50
Spraying Crops— <i>Weed</i> .....	J	.50
Spraying of Plants— <i>Lodeman</i> .....	M	1.00
Talks on Manure— <i>Harris</i> .....	J	1.50
Farming with Green Manures— <i>Harlan</i> .....	F	1.00
Fertilizers— <i>Voorhees</i> .....	M	1.00
Irrigation Farming— <i>Wilcox</i> .....	J	2.00
Irrigation for Farm, Garden and Orchard— <i>Stewart</i> .....	J	1.50
Irrigation and Drainage— <i>King</i> .....	M	1.50
Gardening for Profit— <i>Henderson</i> .....	J	1.50
New Onion Culture— <i>Greiner</i> .....	J	.50
New Rhubarb Culture— <i>Morse</i> .....	J	.50
Asparagus— <i>Hexamer</i> .....	J	.50
Vegetable Gardening— <i>Green</i> .....	WP	1.25
A B C of Potato Culture— <i>Terry</i> .....	R	.45
Tomato Culture— <i>Root</i> .....	R	.35
Melons— <i>Burpee</i> .....	B	.20
The Vegetable Garden— <i>Velmorin</i> .....	D	4.50
The Forcing Book— <i>Bailey</i> .....	M	1.00
Garden Making— <i>Bailey</i> .....	M	1.00
Practical Garden Book— <i>Nunn &amp; Bauey</i> .....	M	1.00
Hedges and Windbreaks— <i>Powell</i> .....	J	.50
The Soil— <i>King</i> .....	M	.75
Fertility of the Land— <i>Roberts</i> .....	M	1.25
The Farmstead— <i>Roberts</i> .....	M	...
Rural Wealth and Welfare— <i>Fairchild</i> .....	M	...
Farm Poultry— <i>Watson</i> .....	M	1.25
How the Farm Pays— <i>Crosier &amp; H.</i> .....	H	2.00
The First Book of Farming— <i>Goodrich</i> .....	J	1.00
Cyclopedia of Agriculture.....	J	4.50
The Principles of Agriculture— <i>Bailey</i> .....	M	1.25
Roses and How to Grow Them— <i>Sibson &amp; Holman</i> .....	G	.50

## ABBREVIATIONS

Pacific Press Pub. Co., San Francisco, Cal.	P
Orange Judd Co., New York.....	J
Webb Publishing Co., St. Paul, Minn.....	WP
A. I. Root Co., Medina, Ohio.....	R
W. Atlee Burpee, Philadelphia.....	B
J. H. Gregory, Marblehead, Mass.....	G
Doubleday, Page & Co., New York.....	D
A. T. Ferris, Shea.....	F
John Wiley & Sons, New York.....	W
W. W. Wood & Co. ....	WW
J. K. Gill & Co., Portland.....	G
J. B. Lippincott & Co., Philadelphia.....	L
MacMillan Co., New York.....	M
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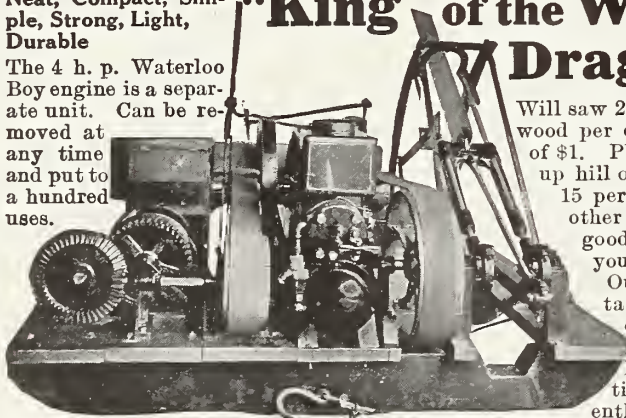
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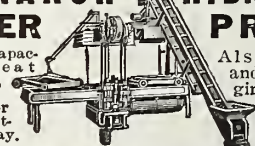
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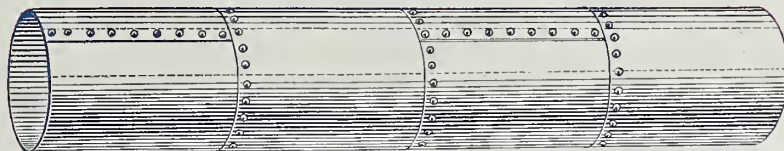
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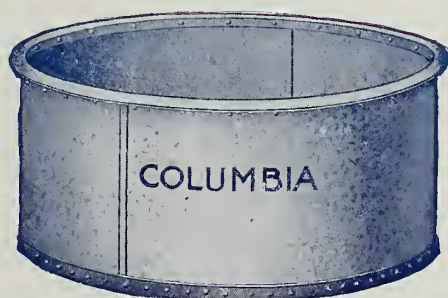
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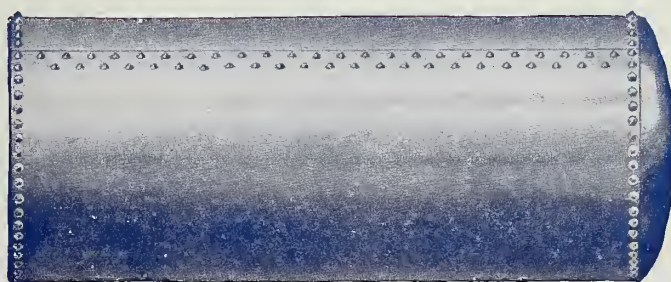


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